



The Ultimate Guide to Foam

Working with foam for cosplay

Pretzl Cosplay - Joyce van den Goor

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NOTE

If you're curious to know more about 'Pretzl Cosplay' then be sure to visit my website www.pretzlcosplay.com to see and shop my handmade collection and my tutorials and patterns.

If you end up using the tips and tricks from this book, I would be thrilled to see your work. Please tag me with @Pretzlcosplay in your social media posts.

About this book

You may have heard of my crafting book 'The Ultimate Guide to Worbla.' Or perhaps you even have it on your bookshelf! The amazing positive response that I received from you about this book is so heart-warming.

And I got many questions asking when I would release a book about foam. Of course this sounded like a great idea. Ever since I discovered foam as a crafting material, I have created many projects with it and learned many techniques to make awesome things with foam. There's a lot that I know about this material and I want to share it all with you! Like how to decide which type of foam is best for your project, or which glue is just perfect to put your foam armor and props together. There are so many things to learn about foam to make your crafting life easier (and more fun!). So I compiled everything I know about working with foam for cosplay into this book. And that's how 'The Ultimate Guide to Foam' came to be. You're holding it in your hands right now, and that makes me extremely proud! Thank you for getting this book and therefore supporting my work. I truly hope that you will enjoy reading this book and get new inspiration for your own projects.

About the author

Hello! My name is Joyce, but you may know me better as 'Pretzl'. Inside the beautiful province of Limburg in the Netherlands, I work in my own creative business on a daily basis. In my atelier I craft costumes and props, but I also create my handmade 'Pretzl Collection' full of beautiful hoodies, dresses, shrugs, hats, dicebags and more.

When I'm not creating an armor, sewing a dress or building something else, I'm writing tutorial books (like this one!) and making digital patterns for other cosplayers to use to help with their projects. You can even find tutorial videos that I made on Youtube, at the Pretzl Cosplay channel.

My partner in cosplay crime is Pascal. He is the best supporter I could wish for and he does a truly amazing job at taking photos of me in my costumes.

We love to travel to conventions together and have visited many events across the globe. At these conventions I love to host panels where I talk about cosplay crafting and I also enjoy judging cosplay competitions very much. I'm truly grateful that I get to do all this, and your support means a lot to me.





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What is Foam?

This book is all about foam, and how to use it for cosplay. But let's start at the beginning and ask ourselves: what is foam, actually?

Foam is a synthetic material, so it's made out of plastic. This means it's not biodegradable, so the waste that it creates needs to be disposed of carefully.

A characteristic of foam is that it consists of cells, which are open. This makes the material lightweight, and depending on the kind of foam, expandable or soft/squishy. Because of this cushioning effect, foam is often used as mats to make playgrounds safer and also to make softer floors for sports. Yoga mats are also often made out of foam. Even softer forms of foam are used to make cushions for furniture for example, or to add padding to the inside of helmets and other hard objects.

Of course there's also expanding foam, which literally expands. This is for example great for insulating purposes.

EVA foam

The most commonly used foam in the cosplay community is the material called EVA foam.

EVA stands for ethylene-vinyl acetate copolymer. It's OK to forget this difficult name, because when you are talking about EVA foam, every cosplayer will know what you are talking about.

Densities

When choosing EVA foam to use for a project, you'll find that there are many many different ones available. Even just for simple EVA foam. Most cosplay supplies shops will have the foams sorted in thickness and densities. The thickness of course tells you how thick the sheets of foam are. The density however tells a completely different thing about the foam, and that's how soft it is. Since foam is an expanded material, it has holes with air in it. This also makes it so great for cushioning. The more or bigger the holes in the foam, the less dense it is, and the softer and more cushioning the foam is. Mostly the density of a foam is expressed in the amount of kilograms that a cubic meter weighs. For example, foam for cosplay can have a density of 30kg/m^3 , 65kg/m^3 , 100kg/m^3 , or even 150kg/m^3 ! As you can imagine, these foams are very different in how rigid they are. Where foam with a density of 30 is super soft, easy to cut with simple scissors and super easy to bend and fold and could even let light shine through, a foam of density 150 is super rigid and strong and will be difficult to cut with a knife and bend into a complex shape. Of course all of these can be super useful for cosplay projects. Need something that's super movable? Then low density foam is the way to go! But if you need to build something rigid like a sword or a shield, then high density foam will be the better choice. At first, when starting to work with foam, all these different thicknesses, densities and even colours of foam can feel very overwhelming. But I hope that the information in this book will help you to conquer the world of foam with confidence!

Why work with foam for cosplay?

Some reasons to choose foam for a cosplay (armor) project can be that it's very lightweight (especially compared to Worbla or real metal for example) and that it's relatively cheap. In some countries it may be difficult to find materials like Worbla (a thermoplastic) but craftfoam and EVA floor mats could be easy to find over there. Craftfoam and floormats are mostly made out of EVA foam. So they are great to work with.

Because foam is so lightweight, it works great for creating big and bulky armor without adding a lot of weight to the costume.

Most foam used in cosplay can be shaped with heat which allows you to create lots of shapes. When applying heat to foam, you can shape it and if it cools down, it will stay in this shape. However, this doesn't work as well with every type of foam. Some are easier to heat shape, while others lose the shape quite quickly.

Foam is also easy to cut. You can just use a simple box cutter to cut foam. And thin foam (craftfoam) can even be cut with scissors. This makes it really easy to cut shapes out of foam.





Types of Foam

Welcome to the wonderful world of foam!

If someone says they made a cosplay armor using foam, they will mostly mean 'EVA foam'. But there are many more foam materials that can be used as well. Let's dive into some foam materials that are useful for cosplay crafting.

Plastazote (super low density foam)

Plastazote is a very soft foam. It has big pores which make it really lightweight. Plastazote is very bendable and easy to form. It can be shaped by applying heat to it, but because it's so lightweight, big shapes may not keep their shape after heat shaping it. It's just too soft. This type of foam doesn't need a lot of heat applied to it to shape it. It takes the heat really quickly, and if too much heat is applied, it will melt. It's easy to see when the foam starts to melt, because the surface of the foam suddenly looks different. Less smooth, and more smudgy. Then you know, you took it too far and heated it up too much.

Plastazote foam is available in different colours like black and white. The texture of this foam can be different depending on the company where you buy it. Some will have a quite smooth surface, while others are more porous, really showing the big pores of this foam.

Plastazote foam comes in different thicknesses like 2 mm, 5 mm, 1 cm and I've even seen 4 cm thick Plastazote foam!

The most used Plastazote colour in the cosplay community is white. Because this type of foam has such a low density, it will let some light shine through. In the cosplay community, Plastazote foam is often referred to as 'LED foam'. Just try it out with some LED lights. Turn the lights on and put some white Plastazote foam over it. You'll notice that the light of the LED's will shine through the foam.

Plastazote foam is great for creating volume, but still keeping the weight low. For example it can work great as a base in bulky props or even to put into bulky details on armor pieces. This way, the foam is used to create structural work.

Plastazote foam can also be great for creating voluminous shapes in wigs. Gluing wig hairs to a shape of Plastazote foam can work to create really crazy shapes in a wig, that will still be lightweight.

Because this foam is rather soft, it's not the best choice to use when making pieces that will endure lots of stress, like pulling on it. If used for padding inside of armor, of course, it can handle a lot of stress. But then it functions as a cushion, and no one is pulling on it.





Low density foam

One of my favourites is low density foam. This kind of foam has a low density, which means that its weight per cubic meter is lower. For example, the low density cosplay foam that you can find at most cosplay supplies shops has a density of around 65kg/m^3 . So this type of foam has more 'air' inside it than high density foam because it has more/ bigger pores. This makes the low density foam quite soft and therefore also easy to shape. This foam is less soft than Plastazote, but definitely softer than high density EVA foam. So it's an option in between. Of course the structure of this material makes it lightweight too.

Low density EVA foam comes in different thicknesses (mostly 2mm, 5mm and 1cm) and is sold in sheets. Some shops will sell bigger sheets and others will sell smaller sheets.

Because low density EVA foam is soft, it's easy to cut. To cut the foam, you can use a craft knife (sharp!) or even scissors. A knife will create a cleaner cut than scissors will do though. Even the thicker variants of this foam are super easy to cut.

The softness of this foam also makes it easy to shape. By applying heat onto the foam it can even be stretched out a bit to create round shapes. When gluing pattern pieces together, this foam can be sort of 'forced' into shape because it's so soft.

Low density EVA foam can be shaped with heat, but it can also be burned or melted to create beautiful textures on the surface of the foam.

This foam can be sanded with sanding paper and sanding tools, but because it's so soft, it's easy to slip and sand away too much really quickly. Of course, this can lead to really awesome looking 'battle damage,' which can always be a good solution when you've made sanding mistakes.

All of these things make low density EVA foam a great material for cosplay crafting. But of course, it's not perfect for all projects. The foam is kind of soft, so that also makes it not super strong. So for complete armor pieces that will be under pressure, it may not be the best choice. But for round, organic shapes like horns it's absolutely perfect! Especially the 5mm thick low density EVA foam - that's what I end up using the most out of all types of foam.





High density foam

Besides low density EVA foam, there is of course also high density EVA foam. This type of foam has a high density, which means that its weight per cubic meter is higher. In high density EVA foam, there are different densities available which vary in how strong/hard/sturdy they are. Commonly used high density EVA foam for cosplay is mostly around 100kg/m³, but it also comes in 150kg/m³ or even 200kg/m³!

While the 100kg/m³ high density EVA foam is perfectly suited for most armor projects, sometimes it can be helpful if the foam is even stronger and more rigid. For example for creating props like swords, that need a rigid base. Super high density foam could then be the perfect solution. But of course, the higher the density of the foam, the heavier the foam will be. And it will also be more difficult to cut and will dull the blade of your knife that you use to cut it with much quicker.

High density EVA foam comes in different thicknesses. The most common thicknesses are 2mm, 5mm and 1cm, but sometimes there can also be sizes in between like 1mm, 3mm, 2cm etc. It depends on the shop where you get the foam. High density EVA foam is sold in sheets. Some shops will sell bigger sheets and others will sell smaller sheets. The commonly used 'craftfoam' is also high density EVA foam.

High density EVA foam is not as soft as low density EVA foam so that makes it less suitable for organic shapes. But for lots of armor pieces, it will be the perfect foam to use for the base shapes.

This type of foam can be heat shaped. It keeps its shape really well after it's cooled down again.

Because this foam is harder than its low density counterpart, it's not so easy to 'wiggle' the foam into the right shape when gluing two pieces together. So for this foam, it's more important to be really careful with cutting your pattern pieces really neatly to prevent getting ugly seams and pieces where it just didn't fit.

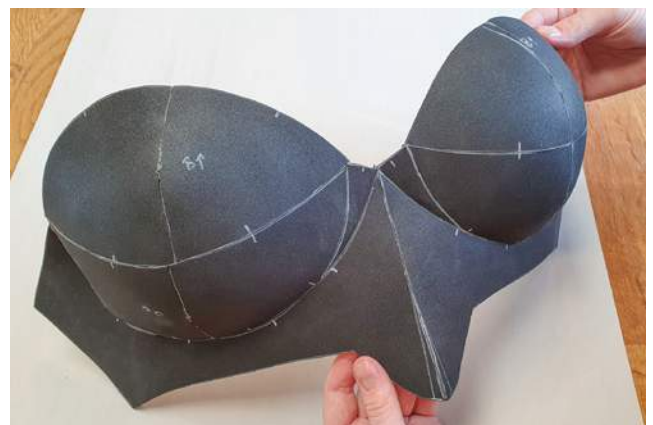
The high density foams at the lower end of the density spectrum can be textured by using a soldering iron or woodburning tool. It will take more time, because this foam melts less quickly than the low density foam, but it can still work.

On the higher density foams, it's also possible to create textures by cutting lines into the foam and then heating the foam up to 'open' these cuts and make them stand out. This for example doesn't work with low density foam. But every foam is different, so it's always a good tip to try these techniques out on a piece of test foam before starting a whole armor build.

High density foam can be sanded with sanding paper and sanding tools. Because this foam has small pores that are really close together, sanding this foam can give a really smooth surface. It takes a bit longer to sand it than low density EVA foam would, but the smoothness of the surface of the finished piece can be really worth it.

Super thin high density foam (1mm thick) is so thin that it can be folded and pleated to look like fabric. This can look amazing on certain projects.

High density EVA foam really is a staple in the cosplay supplies stash. It's amazing for base shapes of armor, but also for props, and it's also great for creating details with.





Foam clay

This foam is a little bit different from all the others. It doesn't come in sheets, but in jars. The name actually says it all; 'Foam clay' is clay and can be sculpted into any desired shape. Foam clay is air-drying, so it doesn't need to be baked. The fact that it's air-drying also means that it's important to store it in a closed container without much air, to elongate its shelf life.

It's available in different colours, depending on where you buy it. All foam clays can be a little bit different, depending on the ingredients. So it's always a good idea to experiment with different brands of foam clay.

Depending on the brand of foam clay it can be really soft and sticky or a little dry. If the foam clay is too soft or wet, you can leave the amount you want to use out of the jar for a little bit so it can get a bit drier. If the foam clay is not soft enough however, you can add some water into it. Just take a bit of water with your fingers and knead it into the clay. Keep doing this until the clay gets to the desired consistency.

To use foam clay, simply take an amount out of the container and sculpt with it. It can be sculpted using your hands, but you can also use clay modelling tools to help create texture and shape. When sculpting the foam clay, you'll find that it is a little bouncy. So some really fine details will probably 'bounce' back and disappear when the foam clay is drying. If the foam clay has more water mixed into it, it's easier to make tiny details. The drier the foam clay is, the quicker the little details 'bounce' back and disappear. So if creating small details doesn't work properly, it's a good idea to knead some water into the foam clay and do the sculpt again.

Typically, a foam clay sculpt will need one or a few days to cure, depending on the thickness of the sculpt. If you're making tiny details, it will take just one day to cure, but if you are sculpting bigger objects, it's better to set it aside for a couple of days before priming and painting it. Depending on the brand of foam clay, the piece can also still be a bit flexible or even squishy. Some foam clays can expand a little while curing and others can shrink a little while others don't change in volume at all. This all depends on the brand of foam clay. So that's another reason why it's a good idea to try a few different brands to find your top favorite foam clay.

After the foam clay is cured, it will be super lightweight. Even lighter than when it was still soft clay! This means you can use it to make super lightweight details on armor and props but also super lightweight objects.

The fully dried foam clay can be sanded with sanding paper or a sanding tool to adjust the shape. This works really well and is also super easy because the material sands away quickly. But make sure that the clay is really fully dry, because if it's still a bit soft inside, sanding it will give a really ugly surface.

It's also possible to use foam clay in (silicone) molds and create replicas of certain ornaments for a costume.

Foam clay (cured!) can be primed and painted just like EVA foam. So if for example a detail made with foam clay is applied onto an EVA foam armor piece, it can be primed and painted in one go together with the rest of the armor piece, and using the same primers and paints.





Special foam products for cosplay

Because EVA foam is such a loved material in the cosplay community, obviously cosplay supplies shops have noticed this and started creating foam products especially designed for cosplay crafting purposes. In addition to the EVA foam sheets, prefabricated shapes are now also available

Because these shapes are all made with EVA foam (mostly high density EVA foam) they are bendable, squishy and lightweight. It's also super easy to cut into them with a knife, and with contact glue they can be glued onto foam projects really well. The foam dowels can be sanded just like normal EVA foam sheets. So this makes them perfect to combine with any foam prop or armor project.

They can be a little pricey, so if you're working on a budget, you may prefer to create the shapes yourself by cutting and sanding EVA foam sheets into the desired shapes. This is of course more work and more difficult to create perfect shapes, but it's also more budget friendly.

A very useful shape are the foam bevels, which come in half round and also in triangular shapes. They are sold in different thicknesses, mostly ranging between 5mm and 4cm and they are mostly 1 meter long so they can be cut with a knife into the right length. For creating detail lines on armor pieces, these bevels are super convenient. They have the same shape all over and are already smooth. So it's not necessary to carve the foam into a bevel shape or sand them. They can just be glued onto armor pieces to create detailing.

There's also full round foam dowels, with a diameter ranging between 5mm and 5cm. The thinner dowels can be very useful for creating faux pipes and tubes in futuristic or even post-apocalyptic costumes. The dowels with a wider diameter can work very well for barrels for guns and rifles.

Then there's also individual shapes prefabricated out of high density EVA foam, like cones, spheres and hexagons. It can be rather difficult to create cones and spheres yourself with just sheets of foam, a knife and sanding tools, so these pre-shaped shapes can speed up a project. The shapes look really neat and are super lightweight. Of course they can be easily glued onto foam projects. The cones and spheres do get rather pricey if you need a lot of them. And especially in the bigger sizes. Foam cones can measure up to 10cm in length which are quite big spikes. Of course there are also smaller cones available, starting from 2cm in length. The foam prefab spheres range between 1cm and 5cm in diameter. These can be very useful for example if a ball is needed to finish of a prop, or for decorations on a crown and more.

Sometimes for a project, you'll need lots and lots of scales to make something look like dragon skin for example. Instead of cutting them out of craft foam one by one, it's also possible to buy pre-cut foam scales. They come in different shapes and sizes and are super easy to glue onto any foam project.

Some projects require a certain texture to be created onto the EVA foam. This always takes a lot of time and especially for this purpose, there are also textured foam sheets available. They come in many popular textures like (dragon) scales and in a metal look.

It's even possible to buy sheets of thin foam that are cut in a way to resemble chainmail and scalemail!

I'm sure there will be more of these innovative products to be developed for the cosplay world. So definitely keep your eyes open for these interesting materials.





Floor mat foam

A long time ago there were no EVA foam sheets available especially created for cosplayers. That's when the only EVA foam that cosplayers could use were the foam puzzle mats which are actually designed to use as padding on the floor in playrooms for kids or fitness rooms. These foam puzzle squares are still available and are also a great option to use if you for example live in a place where the special cosplay foam is difficult to come by.

Most puzzle mats are 1cm thick and come in packs of multiple 40cm x 40cm or even 60cm X 60cm squares. They mostly have a textured surface on the top and a smooth surface on the bottom. If using these mats for armor pieces, it's a good idea to either sand the texture off of the foam or to use the textured side for the inside of the armor piece, so it won't show on the finished costume. Floor mats are mostly made with EVA foam, so they can also be cut with a knife and glued together with contact glue.

Styrofoam

Styrofoam (2) is also a kind of foam. This foam is often found in packaging material and is super lightweight. Sometimes when there's a block of Styrofoam in a package I will keep it and store it for cosplay projects. Of course, it's also possible to buy blocks or sheets of Styrofoam in hardware stores.

Styrofoam can be used as a middle layer inside a prop for example to create thickness without adding weight. It can be cut with a knife quite easily, but it also breaks quite easily, so some extra care is always advised when working with the fragile Styrofoam.

Styrofoam blocks are really easy to sand into shape with sanding paper. For example for making lightweight shapes like a blade for an axe or a sword can be made this way. The Styrofoam itself is super fragile though, so it will always need another material to cover it to make the final piece strong. For example I used Styrofoam to create the blade shape of the axe for my Astrid Hofferson cosplay with Styrofoam (6), and covered it with Worbla's Finest Art (7) to make the prop strong. This resulted in a lightweight blade that's still very sturdy (8).

Styrofoam does melt quickly when it's heated up, so when covering it with Worbla, be very careful to not apply too much heat. Besides that, some types of styrofoam, like insulation boards, can dissolve when spray painted. So it's a good idea to test how materials, primers, and paints will all react with each other before committing to materials for a project.

Yoga mat foam

Another foam that may be easier to find than the special cosplay foam are yoga mats (1). These can be made out of EVA foam, but that's not always the case. Yoga mats vary in size and thickness and also in softness and texture. It's not easy to know exactly what material the yoga mats are, so it's possible that for example when heating up foam from a yoga mat it can cause really toxic fumes to come off. So I would advise to not use yoga mat foam in combination with heat, just to be sure. For creating extra sturdiness inside fabric work for example, this foam can be a great option. If using the really thin yoga mats, this foam is super soft and can easily be cut with scissors and even sewn through with a sewing machine. For my Pajama guardian Lux cosplay, I used yoga mat foam inside the big purple bow on the front and also inside the pink wings on the back of the costume (4).

Because it's so soft (and cheap too!) it can also work great for creating bigger parts of costumes that need to be lightweight. Like wings for example. When using yoga mat foam for wings, it will need something inside to stabilize them like wire for example.

For my Princess Cadence cosplay I used yoga mat foam to create the wings (5). There's iron wire inside that serves as a sturdy base and helps to keep them upright.

Upholstery foam

Upholstery foam (3) is super soft foam that's made especially for furniture work. It has really big pores so it's full of air. This makes it really soft, super squishy and flexible. Because of the material that's it's made of, it is rather heavy though.

This kind of foam comes in various thicknesses, weights and colours. It can be found at fabric markets for example or at fabric stores.

Upholstery foam is great for cushioning, for example inside a big helmet. It can also be used for bodyshaping in costumes by adding carved out pieces of upholstery foam into leggings to create bigger hips for example or adding it to a shirt to create a muscle suit.

Fursuit heads are also often made using upholstery foam to carve the base shapes out of.





Tools & materials

Like with all materials, working with foam will get easier and more fun if you have the right tools. In this chapter, you'll find a list of the basic tools and accessories that I advise to use when making projects with foam.



Tools and accessories

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Knives and scissors

Since foam is a relatively soft material, it can be cut with simple tools like craft knives or even just a box cutter. Thin foam like craft foam can even be cut with household scissors.

Some knives will come with changeable or breakable blades. When the blade is too old or becomes too thin because of continued sharpening, you can then break a piece off so a new and sharp cutting edge will be revealed. With the changeable blades of course, you can take the blade out of the knife and put a new one in. Of course always be careful when using knives. Never cut towards yourself but always away from yourself to prevent cutting yourself.

Knife sharpener

When cutting foam, knives will dull very quickly. That's why it's important to keep some sort of sharpener at hand while cutting foam so you can sharpen the blade of your knife in between cuts. How often you'll need to sharpen the knife depends on the hardness (density) of the foam and of course the length of the cuts.

There are special tools for sharpening knives available, for example there is one that's like a 'pen shaped' sharpener. This is the one that I personally use because it's so small and easy to work with. You just run the blade of the knife over the sharpening part of the sharpener to sharpen the edge of the blade. Then the knife will be ready to use again. It's also possible to use a whetstone for sharpening your knives, or a sharpening rod.

If you don't have any of these tools at home, you can even use simple sanding paper to sharpen knives for cutting foam.

Cutting mat

A cutting mat is necessary when cutting foam with a knife. This mat can be put on a table to protect it from the sharp knife. Cutting mats come in various sizes, which can all be helpful. I personally have one in A3 size and one in A1 size. The first is a smaller cutting mat that's super easy to store and always fits on the working table. The large one is really nice for cutting large shapes out of foam. But it's also more difficult to store and to put on the table because it takes up so much space.

Most craft stores will sell cutting mats.





Heat gun

At some points in the foam crafting process, heat will be needed. For example to heat up the foam so it will get softer so it's easier to make curved shapes. Or to heat shape an armor piece for example to make it nice and round instead of flat.

When a foam piece is heated up, it's also possible to press textures into it to create realistic looking surfaces like for example leather or scales. Right at the end of the foam crafting process, the foam can be heat sealed to prepare it for priming and painting.

So a tool for applying heat to the foam is very important. A simple hairdryer won't do the job because it just won't get hot enough. A heatgun **(1)** though, is just perfect for this purpose. These hot air blowing machines can be bought at most hardware stores. It's important to choose a heatgun that is strong enough (minimum 1500 watts). Mine is 2000 watts and can reach temperatures of 50°C to 610°C (122-1130°F) however I never use it at the highest temperature. For me, the sweet spot is at around 300°C (572°F). This is of course a very high temperature and it shouldn't be used for long periods of time because of safety. Just heat up the foam piece that you are working with, bring it into shape and then immediately turn off the heatgun again and put it aside.

Something else to look for in a heatgun when shopping for one is that it has a steeplessly variable temperature. That way you can easily adjust the temperature of the heat that blows from it so it fits your working style perfectly. Perhaps you will find that you like to work with a lower temperature than I do. That's completely possible and no problem at all. Just don't set it too hot, because that's very dangerous. Also never touch the metal part that the hot air comes from when you just used the heatgun. This part will stay hot for quite a while and it's easy to get burn wounds from that. Don't do that. Cosplay battle scars are not as cool as they sound.



Silicone mat

A silicone mat **(2)** is useful for foamwork for two main reasons. The first reason is to protect your working surface against the heat from your heatgun when heating up foam to shape or seal it. The silicone can withstand high heat and will protect your working surface like your table that way.

The other reason why you'll want to invest in a silicone mat is because it's a great non-stick surface for foam clay sculpting work. The foam clay will stick to lots of things, but not to silicone.

Silicone mats can be found in different sizes and thicknesses. The one that I use is a large one (A2 size) that's also rather thick. It's milky transparent so it's also possible to put a pattern beneath the mat when I need a guide for sculpting something in the correct size. This mat can be found at cosplay supplies store Minque and I highly recommend it. If you can't find a big mat like this, it's also possible to use the smaller, silicone baking mats. Those are available at lots of kitchen stores. You may need to use several of them though to get a big enough surface to work on.

Sanding tools

Unlike Worbla, EVA foam sheets can't be sculpted and the surface can't be smoothed out without sanding it. Raw EVA foam can be sanded with sanding paper, sanding sponges **(3)** and also with sanding tools like a rotary tool with sanding tips **(4)** or a delta sander. The power sanding tools will work the best on foam, because they can give a really nice and smooth result. When using sanding paper or sanding sponges, the result won't be as smooth.

When sanding EVA foam, it's important to wear protection like a respirator and safety glasses. During the sanding process, lots of foam dust will come off of the project and this material is not healthy to inhale or get into your eyes.





Vacuum cleaner

To make sanding foam less messy, it's a good idea to keep a vacuum cleaner running while sanding so it can suck away part of the foam dust that comes off the foam project while sanding. You can either hold the vacuum cleaner hose between your legs and hold your foam project above it to suck away lots of the foam dust, or you can put the vacuum cleaner hose somewhere on your working surface so it faces your project while sanding. In the last case, just take some heavy items to put around the hose to keep it still so you don't have to hold it and you'll have both hands free for the sanding work.

Respiratory masks and safety glasses

The foam itself is not toxic. But of course if you heat it up or even melt it, fumes will come off of the foam that are toxic. To prevent inhaling these toxic fumes, always wear a respiratory mask (1) to protect your lungs.

When sanding foam, a dust mask (2) and safety glasses (3) are needed to protect your lungs and eyes from dust.

Depending on the type of glue you are using for the foam, a mask can also be needed when gluing. If you are uncertain if you'll need to wear a mask when using a specific kind of glue, then always read the instructions on the package again or contact the shop where you got it to double check if you need to wear protection. Of course it's always OK to wear a mask also if you are unsure if you need one. It's always better to be safe than sorry.



Painter's tape and paper

When making your own patterns for armor pieces, or when mapping out patterns for details on armor pieces, painter's tape (4) is your best friend. You can use it to wrap around areas that you want a formfitting pattern for. This can be your own body parts or a basic piece of armor that you already made.

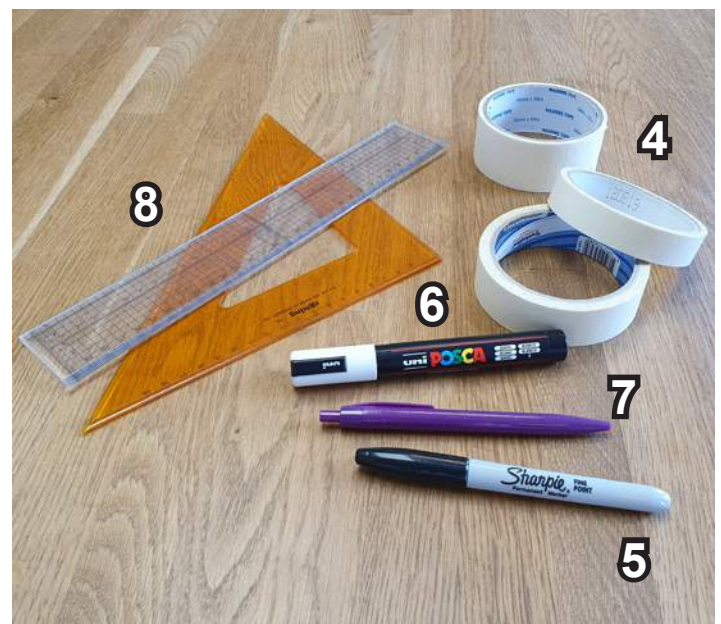
Paper is something you will need to make armor and prop patterns. I personally like to use 'old' paper that would otherwise be thrown away. Think about packing slips that you got with webshop parcels or brown packing paper that came with parcels or gifts. All of that can be used again for pattern making.

Sharpies, pens and pencils

You'll need something to draw designs and shapes onto the EVA foam sheets with. Depending on the colour of the foam, you can use Sharpies (5) or other markers like paintmarkers or ballpoint pens. On dark coloured foam, you'll need to use something that can draw a light coloured line on a dark surface. For example metallic Sharpies or white paintmarkers (6) are good for this purpose. Just try it out and see if the lines are visible enough for you to work with. On lighter coloured foam, you can use cheaper tools to draw with like simple ballpoint pens (7).

Rulers

Rulers (8) and measuring tape can be very helpful when creating your own patterns for armor or props. You can use the measuring tape to measure yourself to find out what shape and size your patterns need to be and of course plastic and metal rulers can be used to further define your patterns.





Random items for texturing

When foam is heated up, it's possible to add textures to it by pressing objects onto it. Some examples of items that can be used for creating textures on foam are aluminium foil (1), scrub sponges (2), forks (3), random tools (4) stones etc. Use your imagination and look through the house for items that you can use. There are so many possibilities!

For cutting small circle shapes, random round (but sharp) items can be used like caps from markers, or even a sharpened piece of PVC pipe.

Zippers, buckles, eyelets, and rivets

When making armor for cosplay it somehow needs to be attached to body parts. Otherwise it's impossible to wear it. For foam armor closures, there's a wide range of items that you can use. To close armor pieces, zippers (5) can be glued onto them. Straps are also a really good option and can be made with elastic, fabric or even (faux) leather. With buckles (6) and snaps (7), straps can be actually made functional and rivets (8) can be used to attach to straps. Velcro (9) can also come in handy for adding to straps on armor. For creating lace up closures, eyelets (10) are very useful.

Contact Glue

The best glue for foam projects is definitely contact glue (or contact cement) (11). It's a very strong glue that will stay flexible when it's fully dried. This makes it so perfect for foam, because the foam itself is flexible too. What makes contact glue different from other glues is that it needs to be applied to both parts that will be glued together. This makes an extra strong bond that many other glues won't be able to achieve. The glue also needs to be applied in thin layers so gluing seams can be nearly invisible if done with care. Contact glue comes in cans but also in tubes. There's gel versions and liquid versions. Both can work for foam, but I personally like the liquid version that comes in a can the best. I've tried out different kinds of contact glue but my favorite is 'Duracoll' from the cosplay supplies store Minque.

NOTE

Of course it's always good to be creative and look around the house to find (maybe non usual) items to use for crafting. This way you can always find new tools for crafting. For example a fork can work to make evenly spaced dents in heated up foam. A bottle cap can also be used to press into heated up foam to create certain shapes. Be creative and think outside of the box when searching for new tools for foam crafting!

Squeeze bottle

When using contact glue for foam it is a good idea to use a little squeeze bottle (12) to better portion the glue. Since contact glue dries up rather quickly when the can is open, it's better to just take out the amount that you need, put that in a squeeze bottle and close the big can of glue again and put it aside. Squeeze bottles can be found online for example at Amazon. They come in various sizes, but I personally like the really small ones (50ml) because they have even less room for air inside the bottle with the glue.

Hot glue

Another type of glue that is useful for working with foam is hot glue (13). Not necessarily for gluing pieces of foam together, because hot glue is rather thick and it cools down quickly, which makes it super difficult to create neat gluing seams. Hot glue does come in very handy for gluing strips of Velcro on the inside of foam armor pieces though. And also to glue decorative strips of faux fur to the inside of armor pieces to make it look like they are padded.





Worbla

Worbla (1) can be great for reinforcing parts of foam projects that just need to be stronger or able to withstand more pressure. Worbla is a thermoplastic material that gets activated by heat. When it's heated up it can be shaped and it also sticks to itself. So this is perfect for reinforcing foam armor. If you want to learn more about the Worbla material and how to create awesome armor and props with it, then definitely check out my book 'The Ultimate Guide to Worbla'.

Brushes for painting

To apply paint to foam (if it's not a spray can) you'll need brushes. Personally I love to use make up brushes because the bristles are very soft and the handles are very comfortable to hold. They also come in various shapes and sizes, which helps to paint larger areas and also tiny details.

Fillers

Where EVA foam pieces are glued together, sometimes seams will still be visible. To hide these seams, fillers can be used. There's different brands of fillers available and some are even especially created for the cosplay community.

A well-known filler that's not created for cosplay is Kwikseal (2) which is an acrylic latex caulk that is originally meant for fix ups in kitchens, bathrooms etc. Special fillers for cosplay are for example the Craft Filler from Polyprops (3) or Flexifiller from Flexipaints (4).

All of these are rather thick pastes and can be used in the same way by applying it to uneven spots on foam work to smooth it out. They are all air drying and not smelly.

Primers

Foam needs to be primed before it can be painted. There are different options to choose from when priming a project made with EVA foam. The biggest difference between the products is whether it's a spray can or whether it needs to be applied with a brush. Both will give different finishes.

Spray on flexible primers

Plastidip is a good example of a spray on primer that stays flexible after it's dry. This is important because the foam also stays flexible. If using a non-flexible primer, you'll end up with cracks in the paintjob later. Flexible spray primer for foam is sold at many cosplay supplies shops, and there are different brands available (5) like Plastidip, which is most well-known, and also Gumidip, Sealprime, Mibenco and more. If you can't find it at a cosplay supplies store, then mostly car parts stores will carry Plastidip. Mainly because it's originally meant for spraying cars and car wheels.

Flexible spray primers for foam can give a really smooth surface when used well. It can take some time to get used to applying the spray primer in thin, even coats without drips or air bubbles.

NOTE

When spraying primer, always wear a mask and gloves and work in a well ventilated area.





Brush on flexible primers

Since spray primer can be tricky to apply, and in some conditions it's difficult to use, for example when you live in a small apartment and just don't have the space for it, there's always still the option to use a brush on flexible primer. There are many really great ones available and it's worth the try. They are mostly also cheaper compared to the flexible spray primers.

Some really great products to use as primer for foam are Hexflex paint (in black) (1), Flexipaint (in black) and Flexbond (which can be used as glue too) (2).

The brush on primers that I'm describing here are also nontoxic so they can be used safely indoors and they don't smell. These primers can be applied with a brush and give minimal brush strokes when you choose a brush with soft bristles like a makeup brush. Brushes can be easily cleaned with soap and water afterwards. When working with these primers, don't keep the bottles/cans open for too long because the air will cause the paint to dry and 'clots' of paint can form which don't look pretty when brushed on your foam piece (except of course if you are looking for that uneven look, which is possible).

Liquid latex

Liquid latex is exactly what it sounds like; latex in liquid form. It's rubber so it's a natural product (non-plastic). It comes in bottles and can be applied to foam projects as a primer. While latex is technically nontoxic, there are quite a few people with latex allergies so for them it's not safe to use. Also the smell of latex can be off putting for some because it does have a distinct odour to it. Liquid latex is mostly colourless and has a milky consistency. It's slightly translucent, which makes it possible to add any colour to it that you want. For example acrylic paints can be mixed with it to achieve a coloured latex. But always do little tests if the colour is important, because when the latex dries, the colour will change.

When applied with a soft brush it's possible to get a slightly smooth surface. Since latex is rather thick compared to the special 'cosplay' brush on primers, brush strokes will be more visible. Of course it's not always a problem if this gives a look that you want. You can even use this property of latex to your advantage by creating a rough texture right away.

When dry, latex will still be really flexible and even elastic. When applying a few layers of it, the final surface will be super strong as well while remaining flexible. This makes it for example also great to use to prime (and paint) LARP props that need to remain as soft as possible and durable at the same time.

Liquid latex can be found at many cosplay supplies stores but also at nearly every craft or art store. It's also useful for making molds. Brushes used to paint liquid latex can be washed with soap and water, but it can be a little tricky to get them fully clean because the latex will form 'globs' between the bristles.

PVA primer or wood glue

A primer that I personally like because of the super smooth surface that it gives is PVA primer (3). Wood glue (or Elmers School glue in the US) gives the same effect. This primer is nontoxic and doesn't smell so it's safe to use indoors. The primer is white in the bottle but dries translucent. After a few layers the surface will be extremely smooth and even strengthens the project, but since the primer is not that flexible, it can crack when the foam is bent. PVA primer can be found at many cosplay supplies stores and wood glue can be found at hardware stores. Brushes used can be easily washed with soap and water.



1



2



3



Paints

To paint foam there are really lots of options to choose from. The ones that are described here are even not all there is. Just look around and you'll find many amazing paints to try.

The biggest difference between the paints is if they are in a spray can or if they are applied with a brush. On the other hand some paints are more and others are less flexible when they have dried. All are useful for foam but of course can give different results.

Spray paints

A well-known spray paint that's often used for foam projects is Plastidip (or Gumidip etc) which is a spray paint that will stay flexible once it's dried. It can be tricky to apply this in smooth layers without drips or airbubbles, so some practise is needed but once you know how to do it, this paint can give really good coverage. It comes in many different colours and even special effects like glitter, metallic or even duo and multichromatic colours. These spray cans are rather pricey, so if you are on a budget this may not be the best paint to use for your foam projects.

There's also acrylic paint that comes in spray cans (1). Amsterdam Acrylic has some colours available and you can find these spray cans at most craft stores. At graffiti shops you can find even more colours of spray paint, but not all of them will be acrylic. These spray cans are mostly cheaper than the flexible spray paint like Plastidip and I personally like to use them. The downside of these spray paints though is that the layer of paint will dry rather rigid and this can give cracks in the paint later. Mostly I don't care too much if that happens (it gives the props and armor some character right?) but for some projects this may be really unwanted. So then it's better to not go for these kinds of spray paints. Of course, when using spray paint there won't be any visible brush strokes on the projects and if done well, the colours will look super smooth (2).



NOTE

When using spray paints always wear a mask and gloves for protection and work in a well ventilated area or outside if you have the opportunity for that.



Brush on paints

Brush on paints are great, especially if you want to work inside or just don't have enough space to use spray paints. To paint foam after priming you can use basically any paint. Just keep in mind that the foam stays flexible, and some paints may not after they are dried. If it dries non flexible, this can cause the paint layer to crack.

Flexible brush on paint

Some paints are especially designed for the cosplay community and work just great on EVA foam. Some examples of those are Hexflex paint (1) and Flexipaint. They are sold at cosplay supplies stores so they should be easy to find. These paints come in a wide range of colors, both glossy and matte. So for most projects there will be fitting colors available.

The paint can be applied with brushes. I personally like to use makeup brushes because they have soft bristles and give minimal brush strokes on the final paint job but other brushes work too. Brushes can be cleaned with water and soap since these paints are acrylic based and also latex free. So great if you have a latex allergy.

If you're not allergic to latex and don't mind the little less smooth surface, you can also mix acrylic paint into liquid latex to get a super flexible colored layer of paint.



Acrylic paint

As the color layer (on top of the primer) acrylic paint (2) can be used. It's very easy to find this type of paint in lots of stores. Craft stores and even hardware stores often sell acrylic paint in tubes or pots. The brand Amsterdam acrylics for example has a wide range of colors and also quite a good color coverage.

Acrylic paint stays a little bit flexible when it's dry, so that makes it great to use on foam. It's not as flexible as the special flexible paints for foam, but it still works really well.

Because it's rather cheap and comes in so many colours, this is a great option for cosplayers that are on a budget.

Acrylic paint can be applied with a brush and the brushes can easily be cleaned with water and soap. Acrylic paint also doesn't smell and can be safely used indoors.



Oilpaint

Another type of paint that's great for your foam projects is oilpaint (3). This paint stays wet for a long time so that makes it great to use for shading because it gives ample time for blending.

Oilpaint comes mostly in metal tubes and is sold at craft and art stores. The price range of this kind of paint is really wide, and the cheaper oilpaints are mostly not that good. Personally I love the black oilpaint from Winsor and Newton for adding shading to my projects. While it's not the most expensive oilpaint out there, it's also not the cheapest, but it's really amazing and I can recommend it.





Metallic colors

For props and armor that need to look like they are made out of metal, a special kind of paint is needed and that's metallic colored paint. Like with normal colors, metallic paint is available in different options. Spray paints, regular brush on paints, and also flexible brush on paints created especially for cosplay crafting are all available in metallic versions.

Gilding wax

Gilding wax (1) is a special kind of paint that looks and feels different than 'normal' paint. It comes in a jar or in a metal tube and it looks and smells a bit like shoeshine. To apply it to your project you just rub it on, using an old piece of cloth (I like to use old socks). This paint gives a magnificent shine that looks really realistic like metal. It can also give a nice antique look when it's rubbed on a bit messy. Two examples of brands of gilding wax are Pebeo and Rub 'n Buff. This wax paint can also be applied with a brush, but because the paint is not water based, the brushes will be harder to clean.



Metallic acrylic paints

There's of course also acrylic paint in metallic colors (2). Mostly these will be a bit less covering than for example the gilding wax. So you'll need to apply more layers to get a nice color.

Some brands that make good metallic acrylic paints are Amsterdam Acrylics, Folkart and Royal Talens. These paints can be applied with a brush and the brush can be easily cleaned with water and soap.

Metallic flexible paints

Especially developed for the cosplay community are flexible brush on metallic paints. Hexflex paints has a (growing) range of metallic flexible paints (3). This paint has small mica powder in it, which are really tiny glitter particles. These particles give the painted surface an incredible metallic shine. If you look up close, it looks a bit less like realistic metal than for example the gilding wax, but the overall effect looks really beautiful. Since this paint also comes in 'crazy' metallic colors like pink, purple and orange, it's also very usable for crazy colored armor projects. No need to mix colored acrylic paint with gold or silver paint anymore!

These paints can be applied with a brush and the brush can be easily cleaned with water and soap.

Metallic spray paints

If you'd rather use spray cans for adding metallic colors to your projects, that's of course also possible. The well-known acrylic paint brands also have metallic colors and the graffiti paint also comes in metallic colors (4). Mostly, these are the most used colors like gold, bronze, copper and silver. When using normal spray paint on foam projects though, you need to keep in mind that the paint can crack after a while because this paint dries really sturdy and not flexible.

Flexible metallic spray paints

To make sure that the paint layer won't crack, it's possible to use flexible metallic spray paint (5). Examples are Plastidip and Gumidip which come in many different colors and even have some special effects available like just a glitter layer or even chameleon effects.

These paints don't just need to be used for priming but can also be used for adding actual color since they come in many colors.

When using spray paints, always wear a mask and gloves and work in a well ventilated area.





Varnish, finisher

To protect your beautiful paint job it's a good idea to use a finishing layer. There's different options for this final layer.

Flexible spray finisher

Special flexible spray finishers (1) exist and are useful for foam. They come in glossy and matte variants.

Because they are flexible (like rubber) the surface that they create is a bit prone to rubbing off (2). So for projects that will be moving against each other a lot, this may not be the best option because the protective layer can come off at places.

Always wear a mask and gloves and work in a ventilated area when using spray paints.

Spray on varnish

The normal acrylic spray varnish (3) that is sold in craft stores and art stores can be great to finish your project with. Just keep in mind that these paints will give a rigid layer once they are dry, so the paint can crack later.

Always wear a mask and gloves and work in a ventilated area when using spray paints.



Hexflex clear

Hexflex clear (4) is a flexible protective layer that can be applied with a brush. It doesn't smell and can be safely used indoors. Brushes can be cleaned with water and soap. This product is basically just Hexflex paint but without a color. It works great as a top layer on painted foam props and armor. Since it's flexible, the layer of paint won't crack. The surface is between matte and glossy. Not super glossy but also not super matte. It looks really good on a lot of projects.

Acrylic varnish

Another brush on protective layer is acrylic varnish (5). This can be bought at craft stores and art stores. It comes in both glossy and matte options and can be applied with a brush. This varnish stays a bit flexible when dried, but not as flexible as Hexflex clear for example. It's still a great option to use on foam props and armor because it's quite cheap. When using the glossy variant of the brush on acrylic varnish, it's possible to create super shiny surfaces on painted foam projects (6).

Brushes can be cleaned easily with soap and water.



Foam techniques

Foam is a wonderful material and it can be used to make amazing props and armor. Now that you know everything about the different kinds of foam and the tools and materials that will come in handy, it's time to create cool projects.



Cutting foam

The first technique to master when starting to work with foam is definitely cutting the foam. It's really important to do this with care because it will show in the result of your work.

Always use a sharp knife

It doesn't really matter which type of knife or brand you're using, as long as the blade is kept sharp. A simple box cutter will do the job when it's sharpened frequently.

I personally like to use the small craft knives with interchangeable blades. Because I keep sharpening the blades though I only need to change them rarely.

At the start it may seem like it's not important to sharpen your blade, but once you start doing it you will notice quickly that the cut lines are much cleaner. The clean cuts make it way easier to glue two pieces of foam together with nearly invisible glue seams. So it's really worth it to sharpen your blade often between cuts.

Foam will dull a knife's blade quite quickly. It's possible that you'll have to sharpen it after a few cuts already. Thicker foam will cause the blade to dull even quicker. Softer and harder foams can also vary the time that's in between sharpening sessions. My rule of thumb is to sharpen my blade before I think it's necessary. Then none of my cut lines will be messy because I'll always have a sharp blade. To sharpen the knife simply run the blade across a sharpener of your choice. I personally love to use my 'pen

shaped sharpener' (1) that I got at a hardware store. But a piece of sanding paper (2) works perfectly fine too. Just always keep it next to you always when working on a foam project for quick sharpening sessions!

And when the blade gets too thin or old you can 'snap' it off (3) and there'll be a fresh sharp blade for you on the knife.

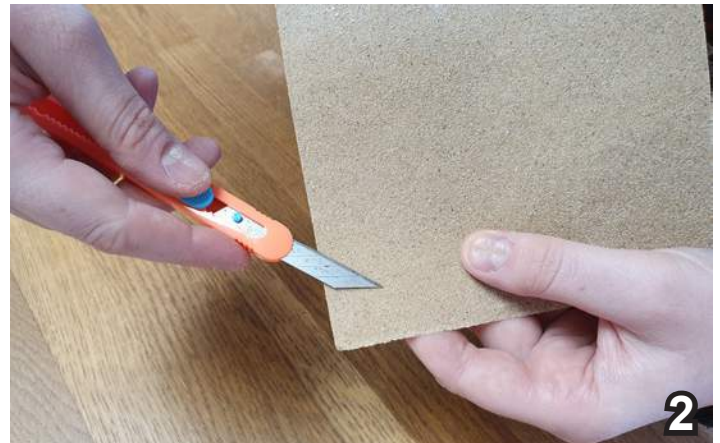
Of course this only works on the knives that can snap off.

On other knives, you may be able to take the whole blade out and swap it for a new one (4). Sharpening the blade will create less waste, compared to not sharpening the blade, because the blades will last longer before having to change them.

NOTE

Oops forgot to sharpen the blade?

And now you ended up with a terrible messy cut? Then you can always still sand the edge of the foam with a rotary tool to make it nice and smooth again. But of course that's messy work so it would have been smarter if you had just been less lazy and sharpened your blade. You know it's true.





Types of cuts

Not all cuts into foam are the same. The angle of the cut is really important and will determine how the final project will look at the point where you glue these pieces of foam together. Let's look into the different angles to cut foam and see what results they give when glued.

Straight cut

The most used cut for foam work is a straight cut. This is when you cut the foam sheet at a straight, 90 degrees angle. Just try to keep your knife straight when cutting the foam (1).

When gluing two pieces of foam together later, it will result in a flat surface. Because the angle of the cut was 90 degrees. This will work for example if you want the glue line to be nearly invisible or if you want to create round continuous shapes (2) like with a tankard for example or a round bracer that goes all around the arm without an opening. With straight edges on the foam you can also create 90 degrees edges (3).

NOTE

When cutting craft foam, you don't even have to use a knife. This foam is so thin and soft that it's easy to cut with normal scissors too.

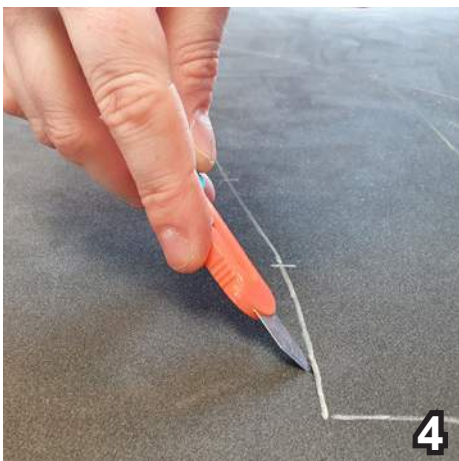
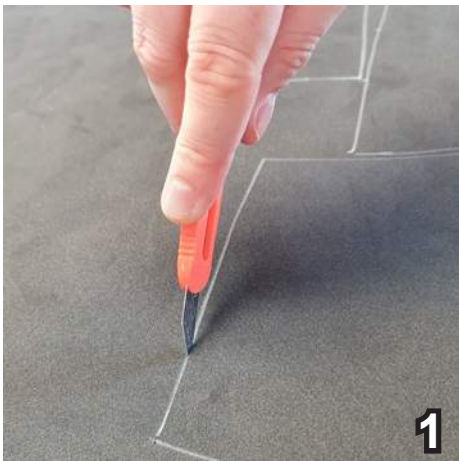
Angled cut

The other frequently used cut is an angled cut (4). Mostly at 45 degrees but it can also be less or more (not more than 90 degrees because then it's not angled anymore).

When two pieces of foam need to create a sharp corner when they are glued together (5,6), they need to be cut at an angle. That way, if glued together, immediately a sharp corner will form. The exact angle of the cut depends on the desired sharpness or pointiness of the corner. The sharper the corner, the more angled the cut needs to be.

Cutting foam at an angle may be difficult if you are trying to get it absolutely right. But because foam is soft, it is mostly OK if the angle is not exactly 90 degrees for example.

There are also special tools available to help with cutting exact angles, but those can be a bit tricky to use and they can be expensive. Personally I always just 'wing it' with cutting foam at an angle. And if the angle was not as perfect as I needed it, I can always go back and take my rotary tool and sand the edges to the right angle.



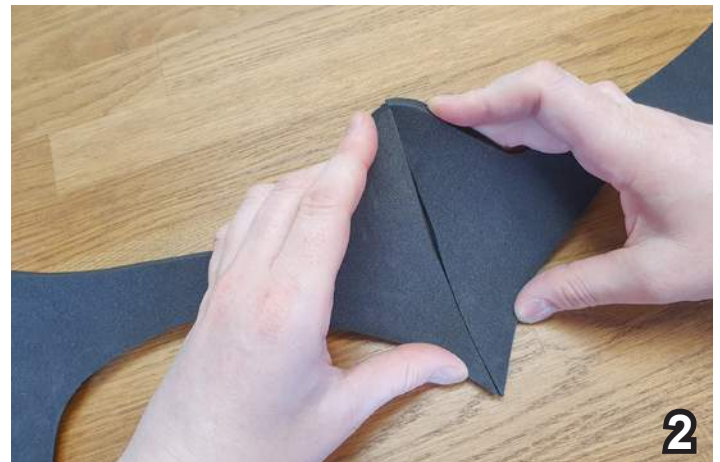


Varying cut

Sometimes you want a straight cut and an angled cut on one piece of foam. Sounds impossible right? But it's not. By slowly changing the angle of the knife while making a cut into foam, the foam will be cut at varying angles **(1)**. This can for example be useful when making horns that need to be all round at the base, but pointy at the ends. The straight cut at the base allows for a fully round horn when the pieces are glued together, while the angled cut

at the points of the horns will make gluing the pointy ends easier and result in a really nice sharp end of the horn.

This also works great for example for a piece that has a pointy edge, like the breastplate base in the pictures below **(1-4)**. In the middle front of this piece, it needs to be flat at the top and pointy at the bottom. A varying cut from straight (top) to angled (bottom) will result in the perfect shape for the piece!



NOTE

Always cut the foam with the knife in a diagonal position. It doesn't matter what angle of cut you want to create. Holding the knife diagonal will cause a larger portion of the blade to cut into the foam which makes it easier to make the cut with less force needed. This will result in a cleaner cut than when you would hold the knife completely vertical.





Undercut

Another interesting and fun way to cut foam is by cutting the underside of the foam piece. This is also called making an 'undercut'. There's two basic ways to make an undercut into foam and that's cutting a 'V' shaped groove or cutting a straight cut into the foam. Both of these cuts need to stop in time and not go all the way through the foam. The front of the foam needs to remain unharmed. This can be tricky at first because you really need to have a good feeling about how deep the knife cuts in the foam. So it's possible that you cut all the way through the foam at your first tries. Just practise this technique on little scrap pieces of foam first before you're ready to cut into your actual projects. The two different ways result in a different look on the outside (top) of the foam.

When cutting a 'V' shape out of the foam **(1)**, you can create a 'ridge' on the outside of the foam by applying contact glue to the inside of the 'V' and then pressing it shut **(2)**. How wide and deep your 'V' is when making this cut will result in a more or less sharp ridge on the outside of the foam **(3)**. When making this cut, put the foam that you cut away aside for a bit. Don't throw this away just yet, because you can use it for the other kind of under cut, the straight one.

To form a ditch on the outside of the foam, just cut a straight cut, but don't go all the way through the foam **(4)**. Now fold the foam to open this cut, apply some contact glue and insert the piece that was cut out of the V shaped cut earlier **(5)**. This will result in a sharp 'ditch' on the outside of the foam **(6)**. The thickness of the little foam

scrap that is glued inside the cut will determine how sharp the ditch is.

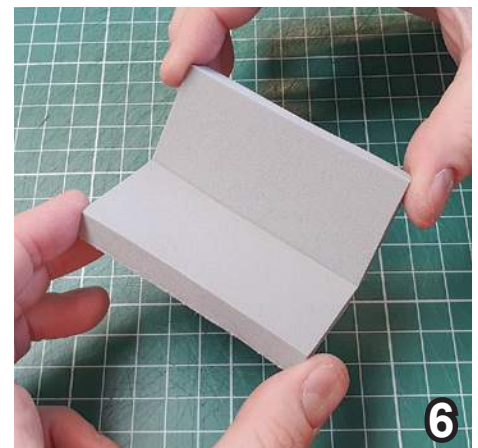
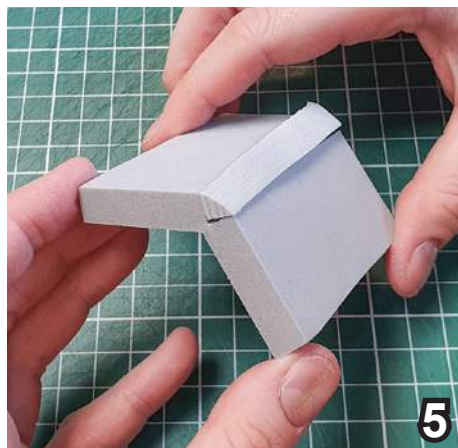
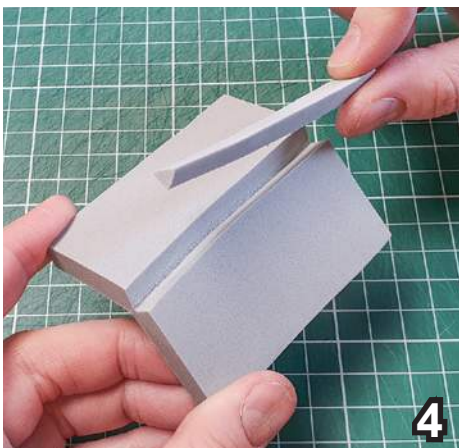
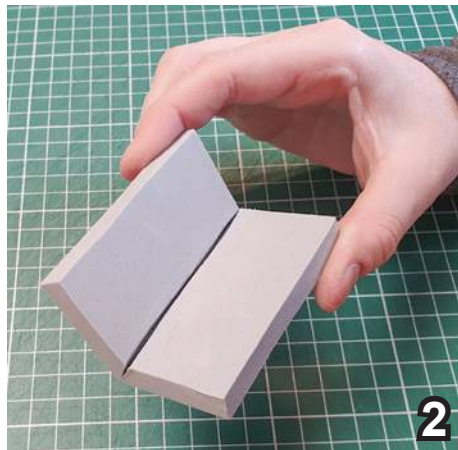
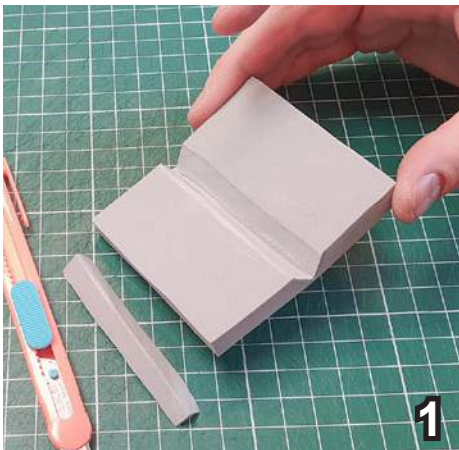
What's so cool about this way of cutting foam is that it's invisible on the outside of the project. Inside the cuts will look a bit messy, but on the outside it looks super neat and clean because no cuts or glue lines are visible.

This technique is super useful for example when making foam stars or gems. Just use both the 'V' shaped cuts and the straight cuts to create amazing looking stars.

For more intricate shapes, the same technique can be used. Just use your imagination and try this technique. The wings on my Star Guardian Soraka staff were made using this technique. Many undercuts in various sizes were made to create the 3-dimensional look of the wings. At the edges of the wings, the foam was cut at an angle to make the edges that are glued together nice and sharp. On page 58 you can find a picture of this cosplay with the staff.

NOTE

When making intricate 3-dimensional shapes with foam, it can look great to use all these different kinds of cuts to create really amazing shapes. Varying the angles of the cuts in the foam can make a project look way more interesting and realistic looking in the end.





Gluing foam

The best adhesive to glue foam projects is definitely contact glue.

Personally I mostly use contact glue that comes in a can (1). When contact glue comes in contact with air, it will dry out and won't work as well anymore and the glue seams will be more likely to rip open. So it's always important to only keep the can open for a short time before closing it again. Contact glue can be applied to foam by using a brush and dipping that in the can of glue and then brushing it on the foam, but it will be very difficult (impossible even) to clean the brush afterwards and the glue will dry up quickly if the can is open for too long. So personally I don't like to use a brush for applying contact glue. Luckily there are more options! Let's explore them.

Put it in a squeeze bottle

To get the most out of the can of contact glue and to extend its shelf life it's a good idea to use a little squeeze bottle for applying the glue to the foam. This way, you can only put the desired amount of glue that you will need for one or two consecutive days into the squeeze bottle and keep the lid of the can of glue closed. If the squeeze bottle is small (mine are 50ml), there won't be a lot of space for air inside the bottle, which makes the glue last for some days before it's dried out. Of course the bottle itself needs to be closed too with its cap when not using it to prevent the glue from drying out.

It may seem difficult or even impossible to get the glue from the can into the squeeze bottle. But if you know how to do it, it's really quite simple. There are a few ways you can do this. One is by simply pouring the glue from the can into the squeeze bottle. This is only possible if the hole in the bottle is big enough to pour the glue in without making a mess. The downside of this way is that there will be glue on the edges of the can, which will eventually make the lid of the can stick to the can, if you keep using this technique over and over again to pour glue in the squeeze bottle.

Another way is to use a syringe to suck glue from the can (2) and then press it into the bottle (3). The advantage of this way is that it's really clean. The can won't have glue on the edges and it's also nearly impossible to spill glue next to the

squeeze bottle because the syringe will fit into the opening of the bottle. The downside of this way is that there will be some excess glue in the tip of the syringe which you won't be able to use. So this bit of glue will need to dry out and then you can pop it out using a screwdriver or a thick needle for example. This means, there is always a bit of waste of glue.

There's also another way to get glue into the squeeze bottle without using other tools. Just squeeze the bottle real hard and then put the tip of the bottle into the glue (4). It doesn't need to be deep in the glue, just half a centimeter is enough. Then release the pressure from the bottle and it will slowly suck up the glue from the can. The advantage of this way is that you won't have any waste of glue and it's also not messy. There will just be a little bit of glue on the outside of the tip of the squeeze bottle, but you can easily use this immediately for the first thing that you are going to glue. Just rub it over the foam. The disadvantage of this way of adding glue into the squeeze bottle is that it is rather slowly, so the can of glue needs to be open for longer, which can shorten the shelf life of the can of glue.

Of course there are other ways to get glue into a squeeze bottle, but these are the three techniques that I have used. The third way is my favourite at this moment.

As long as you manage to get glue into your squeeze bottle and don't make a huge mess, it's all right!





Using contact glue the right way

To get the best results out of your contact glue job it's important to use it in the right way.

First apply a thin layer of glue to both of the pieces of foam that you want to connect to each other (1,2). It's important to really only apply a thin layer. A thick layer of glue will give ugly looking, and opened glue seams. Using a scrap of foam (3) or a spatula can help to get a smooth, thin layer of glue. If the glue has dried up a bit in the can/bottle, then applying thin layers is nearly impossible because the glue has gotten more thick. This will surely give worse results than when the glue was still nice and wet. In that case, you can use thinner to make the glue workable again.

Then after applying the glue to the foam, give the glue some time to dry. This mostly takes some minutes, but it depends on your climate and the brand of glue that you're using how long you will need to wait. Mostly when I'm gluing foam, there are several pieces that I want to glue. So then I just apply glue to all the pieces and when I finished applying glue to the last piece, the first two pieces that I applied glue to will be 'dry' enough to put together. This way I never have to wait!

It's not difficult to see when the glue has the right 'dryness' because it will change from shiny (wet) to matte (dry enough). It's also possible to feel this when tapping it lightly so you can feel that the glue doesn't move anymore. Then, when the glue is not wet anymore but tacky, it's time to press the two parts firmly together (4,5,6). The bond is real strong! So always make sure to put the two pieces exactly together at the first try. Because the glue is so strong, you won't get a second try. It can also help to put the pieces that you want to glue together flat on your table and then press them together. This way, the pieces of foam will align perfectly because they are both pressed onto the flat table. Now your foam pieces are glued together super neatly!

If the glue seam didn't come out super neat (maybe you didn't align the two pieces perfectly) that's also not a problem. Later you can sand it smooth, using a rotary tool for example. Or you can even out the glue seam by smearing some filler over it. More about these techniques later in the book.



NOTE

Contact glue gives fumes which are not healthy to inhale. So always work in a ventilated area when using the glue and also make sure to not touch the wet glue with your fingers. Instead, you can use a scrap piece of foam (3), or a plastic spatula to spread the glue out in a thin layer.

NOTE

Of course always put something over your table when gluing foam, to protect your table. I mostly use a piece of cardboard that's left from packaging.



Registration marks

Sometimes foam patterns can be a bit confusing. Not just if you download them from other cosplayers, but also if you make your own. If a pattern consists of multiple pieces, it's really easy to lose track of which part should go where in the final piece. That's where registration marks and numbering comes in handy! It's always a good idea to number/name your pattern pieces so you'll always know where they go and also to add some registration marks where they connect to each other. Transfer these marks onto the foam pieces after using the pattern pieces to cut them out. This way, you can just align the marks when gluing the different foam pieces together and they will end up just right. This also works really great when making something that needs to be symmetrical. Like a chest armor piece for example.

Gluing foam together in weird shapes

Sometimes a foam pattern can be quite tricky. Especially when the shape of the final piece is curved. Patterns for foam horns for example can seem really difficult to glue together at the first glance. Especially when forgetting to use registration marks.

For example when a horn is curled, the registration marks on the neighbouring foam pieces are not always on the same distance (1). At first this may seem like the pattern is wrong. But in fact it's not. When building a piece like that, just wiggle and press and work the foam so that the registration marks align (2). This will give the really nice curved shapes in the end (3). If you would just start gluing the pieces together, starting on one end and going on till the other end, the ends will definitely not meet. One piece will be longer than the other. And the final shape of the piece that you're building won't be so nice and curved like in the example.

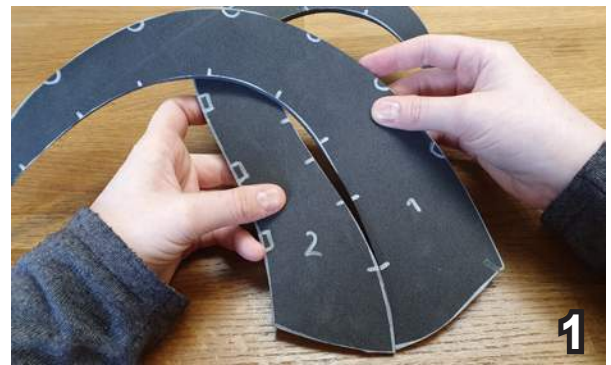
Because warping foam into the right shape can be difficult, it's always a good idea to use the softer foam for these kind of patterns. I personally love to use low density EVA foam in 5 mm thickness to make things like curved horns or even a witch hat with a swirl at the end.

Hot glue

Even if contact glue is the best glue for foam, sometimes hot glue can come in handy too. For gluing foam pieces together to make armor and props, I wouldn't recommend using hot glue because it's nearly impossible to get clean glue seams. This is mainly because hot glue cools down rather quickly so it doesn't give you a lot of time to glue two pieces of foam together in a neat way. Mostly the seams will stand open, after using hot glue.

But for gluing on Velcro to the inside of foam armor pieces (for attachments), hot glue works really well. Just apply some hot glue on the place where the Velcro needs to be (4), and then press the Velcro on there. Apply a thin layer of hot glue around the edges of the Velcro (5) so it stays flat onto the foam. Adding these edges of glue will help to keep the Velcro securely in place because the edges won't rip off when using the Velcro later.

Hot glue can also come in handy to add some decorative things to foam armor like trims of faux fur or some fabric ribbons. When using hot glue always be careful with your hands. The glue gets really hot (hence its name!) and you won't be the first to get your fingers burned by it. Also use a protective layer over your working table to protect the table. I mostly use a piece of cardboard that's left from packaging materials.





Sanding foam

Sometimes it can be a good idea to sand the foam. For example to round off edges of a prop or armor pieces, to hide ugly gluing seams or even to bring a piece of foam (also Styrofoam!) into a desired shape. Foams like Styrofoam can be sanded with sanding paper or sanding sponges, but EVA foam requires a bit more to get a really nice and smooth result. For sanding EVA foam, it's better to use a rotary tool or triangle shaped sanding machine.

Rotary tool

Here I'm mainly talking about the rotary tool, because that's the one that I'm using for my cosplay crafting work. But other machines like belt sanders or the triangle sanding machines also work. Especially for larger areas.

When shopping for a rotary tool, look for the ones that have a flexible extended shaft. The rotary tool itself is quite large and heavy and not really ergonomic to hold. Luckily the rotary tool manufacturers have invented the flexible shaft! This connects to the big rotary tool. It's basically a long tube where the rotating piece is inside. This connects to a more pencil shaped end which is much easier to hold than the big tool **(1)**. All the tips for the rotary tool can be attached to this 'pen shaped end'.

The rotary tool has different speeds that you can choose for the rotating of the tip. For EVA foam, I mostly put it more on the slower end of the spectrum. But of course, this can be different for every brand of rotary tool, so just try all the different speeds and see which works best for you when sanding foam.

The big rotary tool moves around a bit when it's turned on. When it's just put down on a table, it will be noisy and it will move around. So I personally like to put it on a folded towel so it sits softly and doesn't move around **(2)**. Rotary tools also mostly have a loop on the end to hang it. Depending on the brand of tool you're using, it can be recommended to use the tool while it's in a hanging position. So that's also an option when using the tool.

The right protection

When using sanding tools, always wear a mask to prevent inhaling the foam dust, and also safety glasses so the dust won't get into your eyes. Because a rotary tool rotates (like the name already suggests), it's also important to braid your hair if you have long hair **(3)**. If hairs get stuck around the rotating bits of the rotary tool, the hairs can be pulled out of your head. And we don't want injuries! Real life battle scars are not cool!

To suck up most of the foam dust while sanding, I always keep my vacuum cleaner on and put the hose on the table so it's close to where I'm working **(4)**. Every now and then I stop the rotary tool and clean my workspace with the vacuum cleaner.





Direction of the rotary tool's rotations

A rotary tool rotates (oh really?). It rotates in one direction and that's very important to notice. When moving the sanding drum over the foam, this works the best in just one direction, the direction that the rotary tool 'wants' to move in when it's running **(1)**. You'll notice it very quickly which direction is the best because you can feel this.

If you move the tool over the foam in the wrong direction **(2)**, it won't just need more force from you to move it over the foam, but it will also take huge chunks out of the foam **(3)** and this makes it very difficult to create a smooth surface with sanding. Especially with softer foam (low density EVA foam) this can get pretty messy!

When sanding the EVA foam with a rotary tool it's not necessary to use a lot of pressure. Let the rotary tool do most of the work.

NOTE

Foam clay sculpts can also be sanded really easily. Just use some sanding paper. It's important that the foam clay is fully dry before sanding it.

Sanding drums on the rotary tool

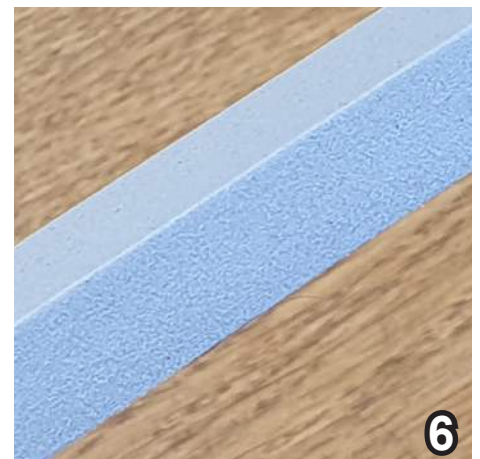
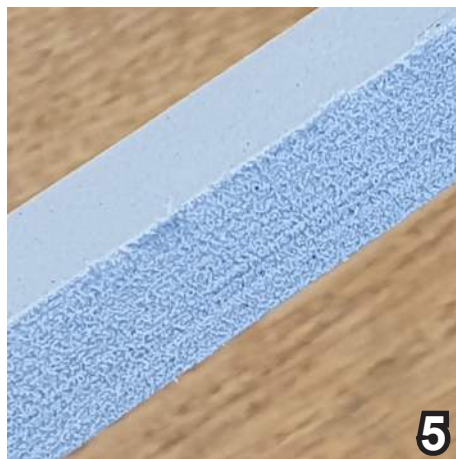
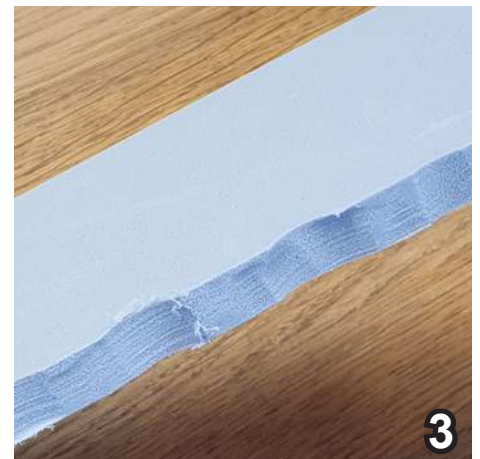
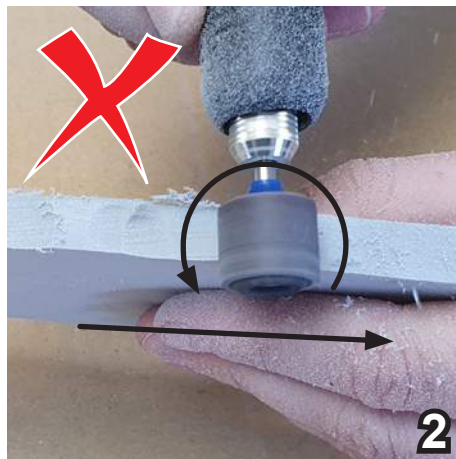
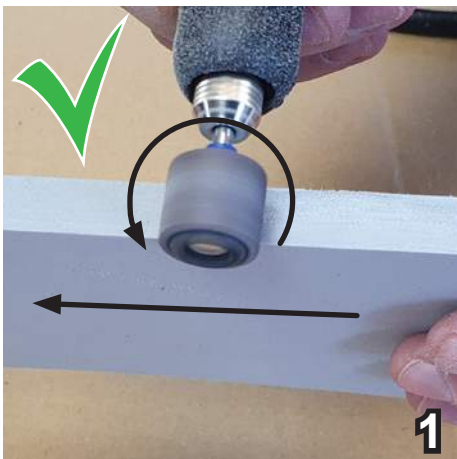
A rotary tool has interchangeable tips **(4)**. For sanding foam, the sanding drums are the best. They come in different sizes and grits.

The bigger ones with a thicker grit (60 grit f.e.) are perfect for sanding away lots of material. This works great when really forming the foam into a shape. With a rough grit like 60, the surface of the sanded foam won't be super smooth. There will be rough patches and some 'fuzzies' on the foam **(5)**.

For refining the shape and making the surface smoother and getting rid of most of the foam fuzzies, a finer grit (120 f.e.) is a better choice. This gives a much more smooth surface on the foam **(6)**.

In one project, you can vary between the sanding drums to get the best effect.

When the sanding drum moves super quickly over the foam, of course it's get quite hot. Over time, the sanding paper on the sanding drums will get clogged with melted foam. Then it's time to take a new sanding drum and put it on the tip of the rotary tool. Always make sure that the sanding drum fits really snug on the tip of the rotary tool because if it sits too loose, it can come off while sanding and fly through the room. This can of course be dangerous.





Heat shaping foam

EVA foam comes in flat sheets but when it's heated up (with a heat gun) it can be shaped (1). When the foam is warm, bend it in the right shape (2) that you want it in and then put it somewhere where it can cool down in this shape (3). I mostly put it over something or in-between some heavy things so the foam won't bounce back into it's flat shape while it's cooling down. Two tea cups will often do the job for example! Or curve the foam over a soda bottle and keep it in place while cooling down by tying a string around it or a scrap piece of fabric. Some armor pieces like bracers for example are easy to just put over the back of a chair for example to let it cool down. This will also keep them in shape. Just look around the house/workshop and see what objects you can find to help keep the heat shaped foam into shape while cooling down. When the foam is fully cooled down it will keep this shape. Some foams are easier to heat shape than others. Some will keep the shape very well after cooling down but others may still bounce back and try to be 'flat' again.

Or shaping the foam without heat

When trying to bring a curve into a large piece of foam, or when the curve needs to be very strong, it's also an option to take an extra piece of foam (4) and glue this over or under the curved foam piece while you keep it in this curved shape (5). This will force the foam to stay in this shape (6). When doing this, it will be more difficult to heat shape this combined piece, because it's now so strongly forced into the curved shape. But it can definitely work really well. For example for curved shields.

The example in the pictures 4, 5 and 6 is from the back of a spellbook that I made with EVA foam. It needed to be curved so this technique worked just fine!



NOTE

How much heat is needed to shape a particular piece of foam is highly dependent on the type and brand of foam. High density foam will need more heat and sometimes also needs to be heat shaped multiple times again to keep it in the right shape while low density foam may take the heat quicker and will be easier to shape. However, since low density EVA foam is softer, this can also cause bigger curved shapes to just deform simply because of gravity pulling on it.



Adding texture to foam

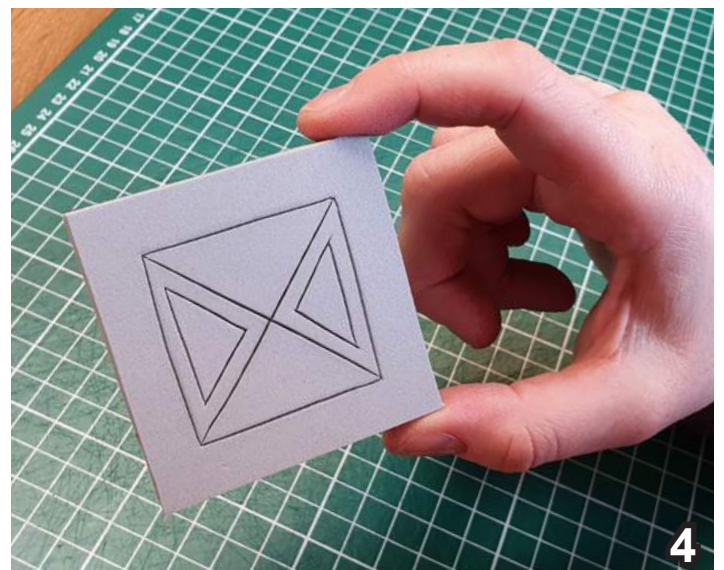
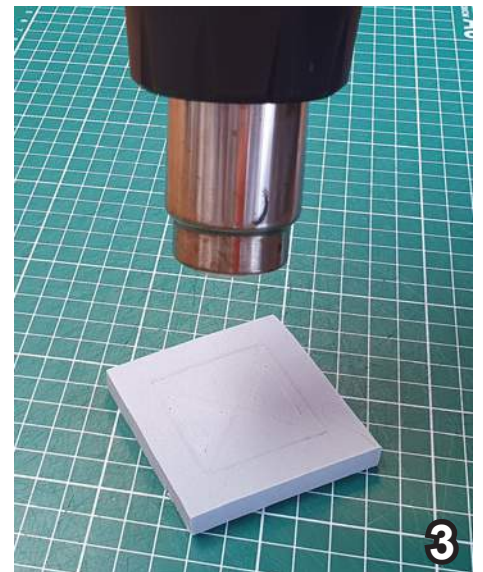
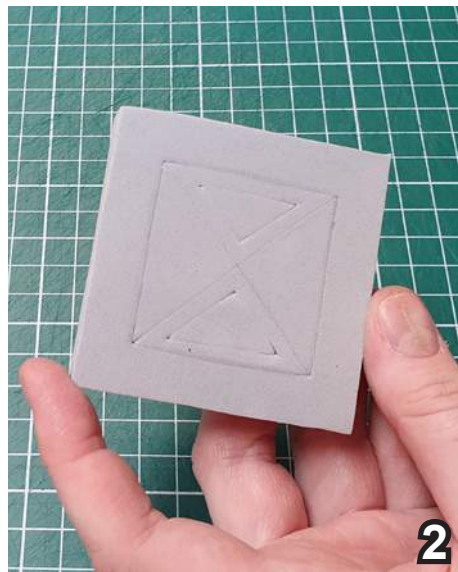
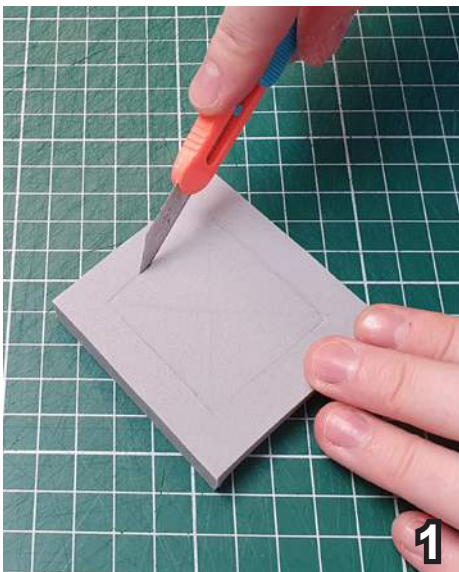
A sheet of EVA foam is flat and smooth. It doesn't have any texture on it (unless it's a floor mat). For a lot of projects this can be super useful, so it's great that it's so smooth by itself. But sometimes you just want some interesting textures to make the foam look like something that it's not. Leather, dragon scales or even tree bark for example. It's all possible, and even more. Your imagination and creativity really are the limit. In this chapter, I'll give you some ideas on how to create different textures on EVA foam.

Expanding lines

Some projects may require smooth lines that don't look organic. There's an easy way to create these.

With a sharp knife, cut (straight) lines into the EVA foam **(1)**, but be sure not to cut all the way through the foam. At this point, the lines will be hard to see, because the cutting lines are so thin **(2)**. It's important to use a sharp knife when making these cuts, because you really need super clean lines for this technique to properly work.

Then with the heat gun blow some hot air over the foam **(3)**. Quite quickly the foam will begin to shrink right where the cuts were made, revealing very clear and clean lines in the foam **(4)**. For example when creating futuristic cosplays or guns and rifles this can be useful since these lines are super straight and don't look very organic.



NOTE

This technique works the best on high density foam. Low density foam doesn't shrink the same way and the lines won't become visible as much as with high density foam.



1



2

Sanding textures with the rotary tool

With a rotary tool, interesting textures can be created in EVA foam. This works both for low density and for high density EVA foam. The sanding tool just carves away material quicker in softer foam than it does in harder foam, so the result may look a bit different on different foams even if you use exactly the same technique.

With the sanding drum on the rotary tool, lines can be carved into the foam (1,2). These will look different than the lines you could make by cutting and then heating up the foam. The sanded lines will be wider and mostly also more organic because it's difficult to carve super straight and even lines with a rotary tool. For creating lines on horns that need to look organic, this technique works really well. The difference between the textured and the untextured foam horn is striking (3)!

Not just for horns, but also if you want to make a wood grain texture or battle damage on foam, this is a way to achieve that look.

By pressing harder or softer against the foam, wider and narrower and also deeper and more shallow lines can be created. The angle of the sanding drum on the foam will also determine the shape of the grooves that you'll create into the foam.

By touching the foam randomly with the sanding drum, you can create a cool organic texture. Perfect for horns or metal on armor that needs to look old.

Hammered metal with the rotary tool

For a cool hammered metal look, the rotary tool is also a great choice. Just use one of the ball shaped tips and put that into the tool. By gently touching the foam time and time again (4), you'll slowly see a texture form that looks like hammered metal (5). Creating this texture may take a while, but it can look super cool on an armor and in the end the extra effort will be worth it.

NOTE

With the rotary tool, often there's lots of different tips that come with it. Try them out and see what effect they all have on EVA foam!



3



4



5



Battle damage

Sometimes when sanding foam with a rotary tool, it happens that the tool slips or you accidentally touch a part of the armor that didn't need sanding... This is when you get to call it battle damage! Mostly this happens to me and that's the moment I go wild with adding more battle damage to my project. Of course you can also plan the battle damage in advance.

The rotary tool can create battle damage onto foam really easily and quickly (1). Just carve some scratches onto the armor by moving the sanding drum over the foam. By making some scratches that cross each other, it will look even more interesting.

Later, when the armor or prop is painted, the battle damage will give it an extra dimension (2).

Not just lines look good for battle damage, but some random dents and chunks taken out of the prop or armor look amazing as well. With the sanding drum on the rotary tool, these shapes are also easy to create. Just sand away bits and pieces of your work. This can be very scary to do because you're actually ruining your neat work but trust me, it looks amazing in the end!

Battle damage can also be burned into the foam. By using an old soldering iron or woodburning tool, you can burn lines, dents and little 'dots' into the foam that can help to create extra texture in the battle damage (3,4).

Try to create the battle damage on the parts of the armor or prop that would get the most impact from actual battle. So think about where a weapon from an enemy would hit the armor or the prop and add some scratches and dents on those places.



NOTE

The density of the foam can make a difference in how the result of these techniques will look. Low density EVA foam for example will burn away or sand away much quicker, resulting in bigger 'holes and dents' while high density EVA foam is more rigid and therefore will burn or sand away slower, resulting in smaller holes, dents and carvings. It's always a good idea to try the techniques you want to use on a scrap piece of foam first, before actually making your armor piece or prop. It would be a shame if the technique you want to use on it to create a cool texture, just doesn't work so well on the particular type of foam that you've ended up using. The armor shown in the pictures above is made with high density foam.



Burning lines

A way to create texture into EVA foam without sanding is by burning lines into the foam. This works especially well with low density EVA foam **(1)** because this foam is rather soft and melts quite quickly. With high density EVA foam it also sometimes works, but it really depends on the brand of foam that you're using. Some high density foams won't be bothered by the heat at all and the burned lines will just look super ugly **(2)**. Typically, it will work better, the lower the density of the foam is. But like always, first try this technique on a small scrap of foam before starting to build the project.

Burning foam can be done with a tool that gets hot. For example an (old) soldering iron or a woodburning tool can be used for this technique. I personally use a woodburning tool because it gets really hot and it came with many different shaped tips, among which are also really thin tips that can help to carve super thin lines in the foam.

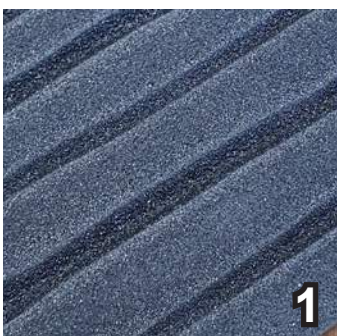
When using these hot tools to burn/melt foam always work in a well ventilated area. I always open my windows and door when I'm burning foam with my woodburning tool. Also wear a mask that protects your lungs from the toxic fumes that come off the foam when it melts **(3)**. Make sure that it's a mask that actually protects you from the fumes and not just from dust. There's different masks and filters available at hardware stores, and if you are shopping for one, just ask the employees in the store for the masks that protect from fumes/gasses. For sanding foam, you'll need a mask that protects from dust. The employees in the stores should be able to direct you to the right masks for the right crafting job! Also wear safety glasses to protect your eyes. Of course, don't touch the hot tip of the woodburning tool because it will burn your skin. To protect your working surface from the heat, you can put something over it. For example a wooden plank or a thick piece of cardboard.

Before starting to burn lines into the foam, you can sketch the rough shapes onto the foam so you'll have a guide. Then switch on the hot tool and wait for it to heat up fully. Never touch it with your fingers to check that. Just try it on the foam to see if it melts or not yet. Then take the hot tool and touch the foam with the hot tip **(4)**. You'll immediately see that the foam will melt and a dent will form in the foam. By moving the hot tip over the foam you can carve lines. By going slower or faster and by pressing harder or softer, wider, narrower, deeper and more shallow lines can be created. Make varying lines to add extra variety to the texture.

This technique works really well for creating a wood grain texture into foam **(5,6)**. Don't just carve straight lines but make them a bit wonky on purpose so it looks more like a gnarled tree. Also carve some ovals to mimic knots in the wood.

While carving lines into foam with a hot tool, the tip of the tool can get a bit dirty with residue of the melted foam. To clean the tip of the tool every now and then you can create this nifty 'soldering iron tip cleaning tray' by taking an empty tuna can and putting some metal wool inside **(7)**. Then just put the tip of the hot tool inside the steel wool to clean it. The tool works the best when the tip is clean and not covered with melted foam. Always be careful not to touch it when it's hot if you try to clean it! Just put it into the steel wool but not leave it there. Also take it out again.

A piece of cardboard can also help to keep the tip of the hot tool clean. Just wipe it across the cardboard to rub off some of the foam residue. Of course don't keep the hot tip in contact with the cardboard for long. Fire is not cool!





Adding foam clay

Foam clay can be used to add texture to a foam piece. The foam clay is soft and pliable (1) when it comes out of the pot. Sometimes it can feel a bit dry, and then it will become softer by just kneading some water into the clay (2).

To apply foam clay onto an EVA foam project, the EVA foam surface needs to be a little bit wet. Just put some water on the foam with a finger (3). But not too much because it shouldn't be soaking wet, just moist.

Now the foam clay will actually have something to stick to, since the water will serve as the adhesive to stick the foam clay onto the EVA foam.

The foam clay surface can be shaped with your hands and of course also with clay modelling tools. Work the clay into shapes and textures that look good on your project (4,5,6). With different shaped clay modelling tools, a variety of lines, carvings and textures can be created.

While the foam clay dries, some of the textures may get lost because the clay gets a bit puffier during the drying process. So don't be afraid to exaggerate the textures by making deeper carvings.

Foam clay can also be sanded with sanding paper or sanding tools really easily after it's fully dried. It's important that it's fully dry, so only do this some days after sculpting.



NOTE

Some foam clays shrink a bit when drying and others expand a bit while there are also some that don't change. If using the foam clay on a large surface, this can cause the project to warp and sometimes the foam clay can even fall off because of this. It's always a good idea to first try to make a small project with a new brand of foam clay so that you can see what the clay does when it dries. A dried foam clay shape can also be glued onto a project with contact glue. So even if something falls off later, that's not such a big problem because you can still glue it back on. Just make sure to wait until the bottom of the foam clay shape is also fully dry because the contact glue can't grip on the still wet foam clay.



Making foam look like leather

It can be a really cool effect to make EVA foam look like leather. For some armors this may look really amazing and it's not a difficult effect at all to achieve.

For this texture aluminium foil is needed. Just crush the aluminium foil into a messy ball **(1)**. Don't make it too tight because we need as much texture as possible on the aluminium foil ball.

Then take your piece of EVA foam that needs to have a leather texture and heat it up using a heat gun **(2)**. The color of the foam changes slightly when it gets hot. Then quickly take the aluminium foil and press it into the foam **(3)**. Use a lot of pressure because it's important that the texture of the crushed aluminium foil gets transferred into the foam.

Repeat this process for all the surface that you want to look like leather. Now when the foam cools down, it will keep

this texture **(4)**. But if it's heated up again, the texture will (if not completely) disappear! So always keep this in mind when using heat to add textures onto foam. First do all your heat shaping of the parts and then add the texture. Or, shape the foam while it's still hot from adding the texture. Just play around and find out what's the best workflow for you.

This technique works especially great with high density EVA foam because the surface is rather smooth and thus it will show the delicate texture of the faux leather the best.

NOTE

A similar effect can be created by using a very rough sponge or something else that's very textured and push that into the heated up foam. Just check what's around the house and try stuff out. You may find that some really unusual items work very well for creating cool textures in foam!





Repairing opened seams

Sometimes a seam where two pieces of foam were glued together can open up again. This can happen when the glue that was used had already dried out a bit (using too old glue), when using hot glue to glue foam together or even heating it up to shape it can cause seams to pop open again. There are a few ways to solve this and to make the seams 'disappear' again.

If a seam is just ugly because on one side the foam piece 'sticks' out, it's easy to fix by sanding down that piece that sticks out using a rotary tool. Just use a sanding drum on the rotary tool and even out the irregularities.

Sometimes sanding down the seam just won't do the job especially when the seam actually bursts open. Then sanding it down won't remove the open seam. Sometimes I try to fix this by putting just a little bit of glue inside the gap, leave it to dry for a few minutes and then firmly press it closed. But this also doesn't always work.

There's several ways to fill gaps in glue seams. One of those is by putting some foam clay into it and then later when it's cured it can be sanded down. This can be a bit tricky because foam clay is rather thick so it can cause new 'bumps' on the spot that you wanted to hide and that way make it even more visible! But it can definitely work.

Of course it's also always possible to just make the ugly seam work for you by calling it battle damage! With cosplay, you can always play the battle damage card. Believe me, you will thank me later.

Then we luckily still have fillers!

Gaps in the seams can also be filled with special fillers like Kwikseal, Polyprops Craft filler or Flexifiller. I'm sure there are many more products to use for this, but these are the only ones I've personally tried.

These all work quite similar. Take a bit of the filler onto a spatula and smear it onto the seam (2). Not just on the seam but also a bit beside the seam. Then dip your finger in some water and carefully rub that over the filler to even it out and make the surface super smooth (3). With some fillers you'll need to wear gloves so always read the guidelines on the packaging.

When it looks good it can be put aside to dry (4). These fillers all dry quite quickly and it mostly takes a few hours for it to dry. If you want to sand the surface afterwards it's safer to let it dry overnight to make sure that it's really cured.

Sometimes the fillers can get into the seams so much that there will still be a dent when it's dried. Then just add more layers of filler until you are happy with the result.

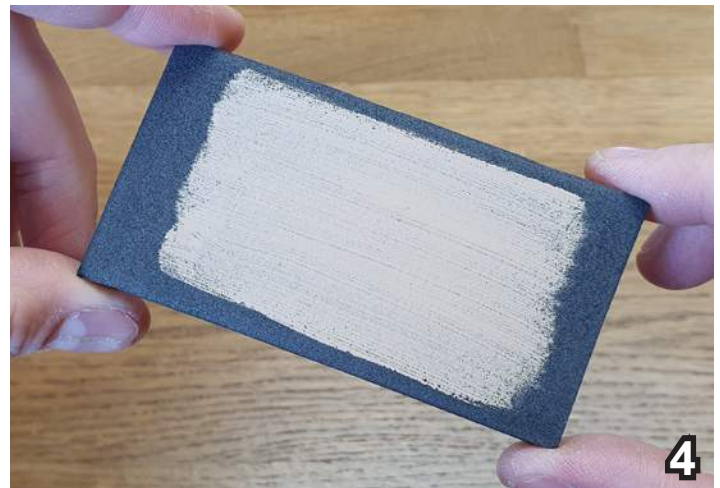




Heat-sealing foam

A very important step in the process of working with foam is heat-sealing. Heat-sealing the EVA foam project will make painting it a lot easier. When blowing hot air with a heat gun over the EVA foam **(1)**, the pores will close. When this happens, the colour of the foam changes slightly to a bit darker colour **(2)**. With some foams this will take longer or shorter than with others. It all depends on the brand of foam. If foam is not heat-sealed, primers and paints will be sucked into the pores of the foam, which will result in a less good looking paint job. The pores will stay visible **(3)** and a lot of layers of paint are needed to get a good coverage. When the pores are closed by heat-sealing the foam, this problem disappears **(4)**.

When heat sealing foam, just hold the heat gun at some distance from the foam and move over the whole surface of the foam. In this step it's also still possible to reshape the foam a bit, because foam is heat shapeable. Always wear a mask when heat-sealing foam because it's possible that some fumes will come off of the foam when it's heated up. Also be careful to not heat the foam up too much because it's possible to melt or burn it.



NOTE

Blowing hot air over your foam project will also help to get rid of the tiny foam fuzzies and foam dust that can still be on the foam after sanding it.



What can you make with foam?

So far in this book you've learned a lot about what foam is and what techniques and tools can be used to shape it, form it and build with it. But what to build with it? There are so many options, ranging from armor to props and even jewellery, horns and ears. Let's explore the possibilities.



Making armor patterns

Before actually cutting into the foam, there'll first need to be a pattern to work from. Of course you can find amazing premade patterns made by me and other cosplayers that you can use for your own projects, but you can also make your own patterns.

If form fitting armor pieces are needed, patterns can be made by wrapping a specific body part and sketching the pattern right on there. That way, the pattern will be perfectly shaped for your own body shape and figure. Everyone is different, so patterns made this way will always be unique.

To use this technique, the body part first needs to be wrapped in some plastic wrap (clingwrap from the kitchen is just fine). Make sure to cover enough and a little bit more just to be sure. Then you'll need a second layer that will serve to draw on to form the pattern. This can be duct tape or painter's tape for example (1).

If you're using this technique to make a pattern for a breastplate for example you can only put tape on one half. That saves tape, and if you mirror the pattern afterwards, it's perfectly symmetrical.

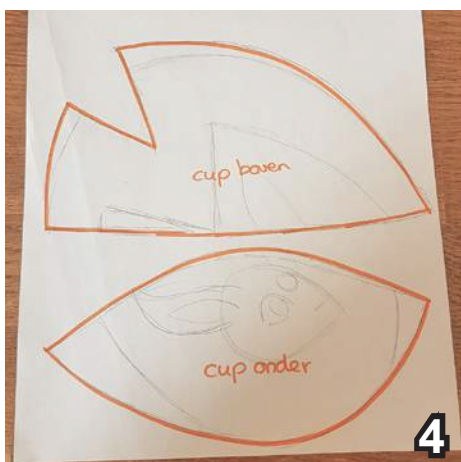
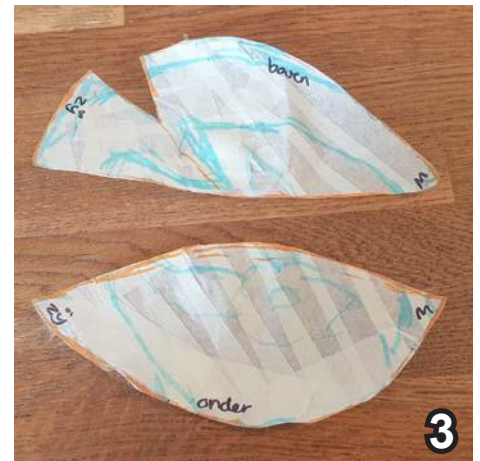
Once your body part is all wrapped with plastic wrap and tape, the sketching part begins. If using a marker to draw the shapes, it's very clear to see the lines. This makes it easier to draw the pattern.

If you need to go all around your body, ask someone to help you with it and draw the pattern parts on your back.

When you're fully finished drawing all the lines on the tape, you can start cutting yourself free. Be careful to not cut into clothes, but only in the plastic wrap and tape (2). Then cut all the pattern parts out (3) and transfer it to some flat paper (4). This makes it easier to store the pattern for later use. The tape patterns have the nasty habit of falling apart over time.

If you drew some registration marks (just lines are OK) on the pattern before cutting yourself free, you now also know which part goes where. It's also helpful to number or name the pattern pieces. For example: Upper part breastplate cup, lower part breastplate cup, middle part waist piece, side piece, etc. If your pattern lays on the table, all cut up, it will otherwise be difficult to remember which part was meant for what.

Now your pattern can be used to create a foam armor piece (5,6).





Using a mannequin as base

If you don't have a helper who can help with wrapping you for a pattern and also to help with drawing the shape of the pattern and cutting you free, it's also possible to use a mannequin instead of your own body to wrap and use that to make the pattern of. If the mannequin is not quite the right size or shape you can always add some padding to it like putting one of your bras on the mannequin so the shape of the bust is more similar to yours or adding some quilt batting around the mannequin (1,2) to widen the hips for example. When doing this, just keep adding batting around the mannequin and then sew a stretchy fabric sleeve (Lycra for example or just jersey fabric) and put that over the mannequin to keep all the padding in place (3). Now you have your own custom sized mannequin for pattern making (4,5,6)!

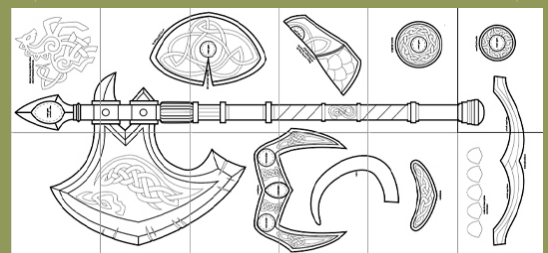
Freehand patterns

Another way to create your own patterns is to just freehand them. Especially if you have experience with drawing patterns then this can really work for you. It also saves material like plastic wrap and tape so I prefer this method whenever it's possible. If you hold on to the armor patterns you've used in the past, you will always have a collection of examples of different armor pieces that fit you and that you can alter for new patterns. I do this too, and I find it extremely helpful. A base shape for a bracer or a breastplate for example will mostly be the same. So examples help a lot.

NOTE

Is patternmaking a bit daunting, or perhaps you just can't be bothered to do this time consuming step? Then I have the solution for you! Find lots of basic patterns and even full costume patterns on my website www.pretzcosplay.com. Other creators like Kamui Cosplay and Kinpatsu Cosplay also sell really helpful patterns on their websites.

Download printable PDF patterns like this from www.pretzcosplay.com





Making foam armor pieces

Some examples of armor pieces that can be created with foam are breastplates, chest armor, shoulder armor (pauldrons), arm armor (bracers, vambraces), hand armor (gauntlets, claws), leg armor (greaves), thigh armor, foot/shoe armor, hip armor, helmets and headpieces. Of course the possibilities are nearly endless, but these are just a few ideas to give a bit of inspiration!

How to build foam armor

There are multiple ways to create armor pieces with foam. If the pattern for the armor piece consists of just one piece, it can be heat shaped until it's right (1,2,3).

But if the armor piece needs to be built up from multiple pattern pieces (4), these will need to be glued together (5,6).

Try to always use contact cement for gluing foam. This type of glue will provide a strong connection of foam parts and if applied in thin layers, the seams can be nearly invisible.

Start with the base shape

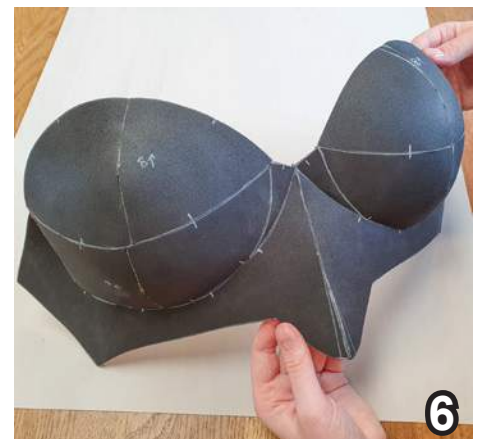
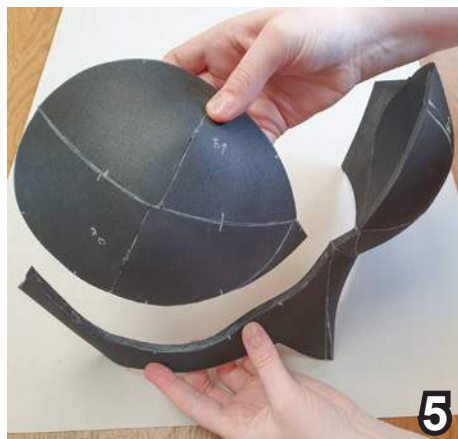
When building a foam armor it's a good idea to start with the base shapes of the armor pieces and later add details like raised edges and sculpted ornaments on them. Also keep doing fitting tests with the armor while building it so you can still make changes to the size and shape of the parts. And mark those changes on your pattern every time you cut in the foam!

Mark your pattern pieces

If you want to use your pattern pieces again in the future, also mark the different kinds of cuts on them like straight cuts, angled cuts and undercuts. Especially with patterns that consist of many pattern pieces, it will be a huge puzzle when you get back to them a week or even a year later. Then you'll be happy that you took the time to write some instructions on the pattern pieces.

Take your time

Since EVA doesn't dry out or cure, there's no need to hurry with making foam armor. You can just start one day with crafting the base shapes for the armor and then put it aside and come back to it later. The foam will still be good to work with.





Foam armor is flexible

Especially in comparison to Worbla for example, EVA foam is very flexible and soft. This means that there is some wiggle room for the armor piece to fit a certain body. But it also means that this can cause the armor piece to deform a bit while wearing it because it will be able to move and bend to the bodyshape of the wearer. While creating the armor pieces always keep this in mind and do fittings of the armor every now and then to make sure it will fit your body and that it doesn't get a weird shape when for example you pull the straps of the armor tight around you.

Make it look bulky

When an armor piece needs to look very bulky, choose thicker foam to build it. 1cm thick EVA foam is great for making bulky armor pieces. It can also help to create some spacers underneath the armor pieces to make them sit at a bit of a distance from your body.

By glueing some extra foam underneath the armor, a hovering effect can even be created where it looks like armor pieces like shoulder armor or hip armor for example is sort of floating over your body. This can also help to achieve the silhouette you want with the costume. Big broad shoulders or extra curvy hips for example. And as a bonus, this will also help to prevent sweat building up beneath the armor pieces which can be super nice especially in summer.

Extra bits of foam can also be used as spacers between armor parts. Like in this example with a layered shoulder piece. The upper piece needs to 'float' higher above the two bottom layers so a piece of foam in between really helps to get the desired silhouette (1,2,3).

When a foam armor piece is completed, it doesn't need an extra layer like Worbla for example. It can just stay like this: pure foam. Of course it does need to be heat-sealed before starting with priming and painting, so the pores of the foam can close.



Armor attachments

Making awesome armor pieces is of course already amazing but at some point it's also practical if they can be attached to your body somehow so you can actually wear the armor and not just stare at it. Since EVA foam is lightweight, there are many options for armor attachments. And even though it's amazing that EVA foam is soft and shapeable, this can also be a disadvantage when trying to decide a good way to attach the foam armor pieces to your body because it's possible that the foam rips or that glued straps will come off. In this chapter various ideas to make armor attachments will be shown.

Lacing

A commonly used technique for making armor attachments is by adding lacing. Laces can be directly laced through holes in the foam armor or some additional (D) rings can be added to put the lacing through. When using D-rings for the lacing, there will always be an opening visible, because the rings are sticking out of the armor.

If the lacing is done directly through holes inside the armor itself, it's even possible to fully close the armor without a gap showing, because the holes for the lacing are not sticking out.

Both methods can work just fine. It's a matter of taste what you will prefer.

NOTE

Lacing is ideal when an armor piece needs to fit several sizes. The armor piece can widen and tighten with how tight you tie the lacing. Don't tie it too tight because after all, it is still foam, and foam can rip.



Lacing with D-rings

To attach D-rings to a foam armor piece, a strap cut out of craftfoam (1) can be looped through the D-ring (2) and then glued closed with contact glue. Then this strap can be glued to the inside of the armor piece (3). In the example on picture #3, it's D-rings to help attach straps to a prop spellbook. So it can work for many projects.

This is optional but if you leave a gap where you want to attach the straps, you can even make it so the straps 'sink' into the armor. This way, there won't be extra thick pieces on the inside of the armor that can cause the armor to look thicker when wearing it. Of course this will only work if the armor piece is thick enough to leave room for the double layer of craftfoam to 'sink' into it.

Directly into the armor

It's also possible to add lacing directly into the armor piece. To do this, drill, melt or cut holes (4) in the back or side of the armor (depends on which piece you want to lace together) and then simply lace it up with some cord (5).

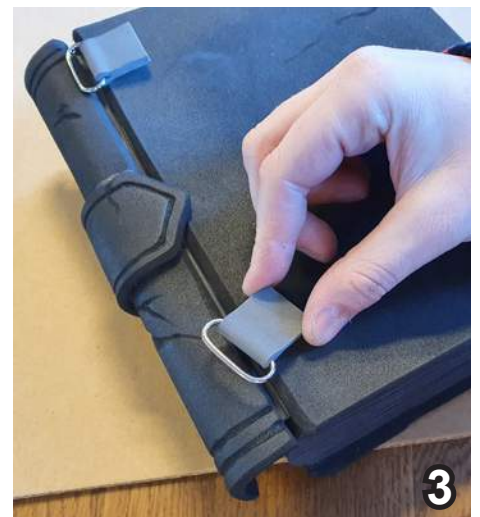
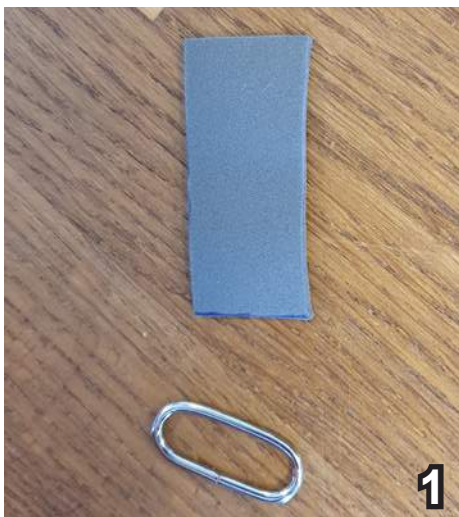
This only works if there won't be much pressure on the piece when it's worn and laced up. To make it a bit stronger, metal eyelets can be inserted into the holes in the foam (6), just like you would do when creating a corset with fabric. If you don't have metal eyelets, you can also use some scraps of Worbla and sculpt your own eyelets by just putting it inside the hole and folding it a bit over the edges of the hole. This too will make the holes less prone to rip apart.

Reinforce with Worbla

To make it even stronger, it's also possible to add a layer of Worbla (thermoplastic) to the inside of the armor piece and even use Worbla strips to attach the D-rings too.

Also when working with holes for lacing, the Worbla layer can be effective. Just heat up the Worbla where the holes are in the foam and poke the holes also through the Worbla. Now when lacing up the armor, the foam won't tear so easily.

Adding the layer of Worbla will make the armor piece stronger and will make it possible to withstand more pressure and lace it tighter.





Straps

Straps can be a great way to attach foam armor to your body. While with Worbla armors, you simply melt the Worbla to attach D-rings to the armor, it's a bit trickier with foam. Foam doesn't just 'melt' together to help attach straps to an armor piece. But luckily there are ways around this.

Materials for straps

Straps can be made out of (faux) leather or elastic bands and they can even be crafted out of EVA foam. When straps are made out of foam, they won't be able to withstand the same pressure as a fabric strap could because foam (especially when it's thin like straps) can tear.

How to make straps

When making straps out of (faux) leather or fabric, just take a strip of the material and fold the edges inside (1,2). Then topstitch over this with a sewing machine to make it lie flat and to get a nice clean edge of the strap (3,4). Straps made with elastic bands can just be pieces of elastic, cut to the right length.

Attach the straps

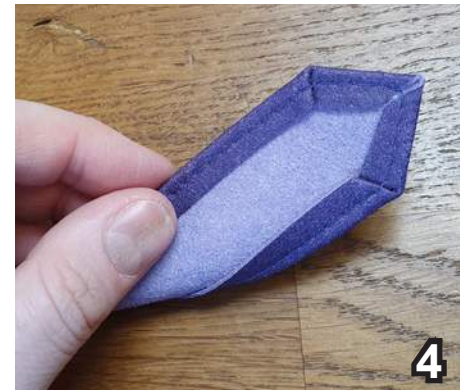
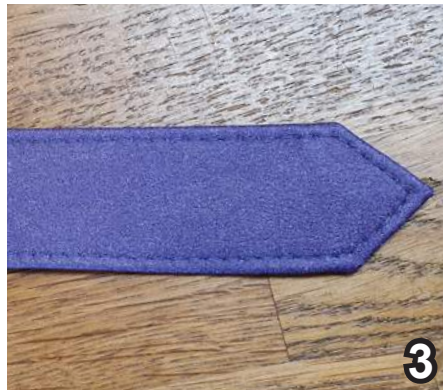
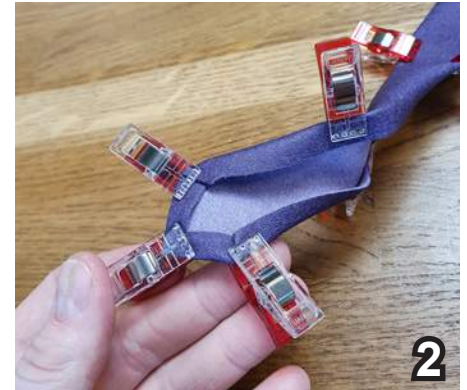
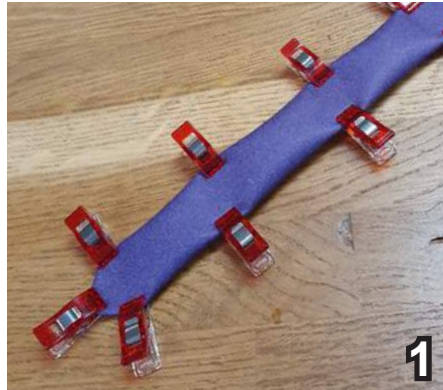
The trickiest part is attaching the strap to the armor piece. It can be glued down with contact glue (5), but depending on the material of the strap, and if it stretches or not, this may not be strong enough and the strap could fall off when wearing the armor.

A way to make this stronger is by first gluing the strap to the inside of the armor and then gluing a piece of craftfoam over this to make the bond stronger.

When the strap ends in a 'T' shape or if there are some holes inside it, this can make it even stronger. Because then, the piece of craftfoam that gets glued on top, will have more places to stick to the actual foam, and not the fabric. It's a bit difficult to explain, but I hope you understand.

Reinforcing the bond with rivets

The bond can be made even stronger by adding actual rivets through the armor and the strap where they meet (6,7,8). For rivets, you may need a special tool, however it can also work with a hammer. But be careful because foam tears quicker than fabric.





Strap all around

It's also possible to create straps that are made out of one continuous piece. Then it needs to be glued on the inside of the armor over the full width of the armor piece. Gluing a piece of craft foam on top will make it more secure. I've used this technique to keep the upper arm armor pieces for my Demonhunter (1) on my arms. The big strap closes with velcro (2) and goes fully around my upper arm (3).



How to open and close the straps

Sometimes straps won't need a closure. For example when they just slip over an arm for example and don't need to be loosened or tightened. Then a strap can just be one piece, without a closure. But most times a closure will be needed.

Buckles and Velcro are great

A normal buckle or snap buckle can be added to the two straps ends (4). When using a normal buckle, you can even make it adjustable by punching several holes into one of the straps.

Velcro is also a good, easy to use and a very lightweight option. Either sew some Velcro to two straps and have these connect to each other or sew Velcro to one strap and glue (hot glue) the other part of the Velcro to the inside of the armor so the strap can be attached there.

Another way for using Velcro is with a D-ring on one end. Then just sew both pieces of Velcro onto one strap and loop that one through the D-ring, fold it double and press the pieces of Velcro together to close the strap.

With Velcro, there will be a bit of wiggle room for sizing, since the pieces of Velcro don't have to align 100% perfectly. So you can wear it a bit tighter one day and a bit looser another day.

Stick armor to fabric with velcro

Since EVA foam is a lightweight material, it's quite easy to make an attachment for an armor piece, detail or jewellery piece to stick to a clothing item. By simply sewing some Velcro on the garment and gluing the other half of the Velcro on the bottom of the EVA foam piece, you immediately have a way to stick the foam piece onto the garment and it's also super easy to take it off again.





Velcro has two sides

When using this technique, always sew the soft side of the Velcro (loops) on the garment and glue the hard side of the Velcro (hooks) on the armor piece. When washing the garment in the washing machine, the soft side of the Velcro won't damage the fabric, where the hard side of the Velcro could definitely make some scratches on it.

NOTE

Keep EVA foam pauldrons in place by using Velcro on the shoulder straps of a breastplate (1). Then you can just stick the armor piece right on and it will stay there while wearing it (2)!

This method works great for example for shoulder pieces that sit on top of an undergarment (1,2). It works really well for bracers too. When you don't want visible straps or lacing, just sew a sleeve for your forearm and sew some Velcro on it (3). Glue the other part of the Velcro to the inside of the bracer and then just stick it on there (4)! It's super easy and it holds really well since the foam is so lightweight. This even worked for me with bracers that I made with craft foam and a single layer of Worbla. Even with the Worbla it was still lightweight enough for the Velcro to hold it in place.

When making leg armor that has no visible straps this is also a good technique. Especially when you wear leggings or pants underneath the armor, it's easy to sew some Velcro on the leggings or pants for the armor pieces to hold on to. Or sew legwarmers/sleeves (5) that the armor can hold on to with velcro (6,7).





Zippers

Zippers can work very well as foam armor closures. Especially when an armor piece needs to fully close around an arm or leg. For this technique you can use either separable zippers or non-separable zippers. It all depends on if the armor piece needs to fully open in order for you to stick your foot or hand through or if it's also OK when just a part of the armor piece opens. So measure this first before buying the zippers for your project.



To add a zipper to an armor piece, the fabric strips of the zipper can be directly glued to the inside of the armor piece. To give the glue some extra surface to attach to, it's also possible to first sew an extra strip of (non stretchy) fabric to the sides of the zipper and then glue those to the foam. Contact glue and hot glue can be used for this. First use contact glue to adhere the fabric to the foam and then secure the edges of the fabric with some hot glue.

To secure it even more, it's also possible to add some rivets through the foam and the fabric. If you look closely on photo 1, you can see that I also added a few rivets to these leg armor pieces to give it a bit more strength where it is attached to the fabric.

Another option that works really well is to sew a whole fabric 'sleeve' that can be glued to the inside of the armor piece like I did with the leg armor on this page. That way, the fabric also closes fully around the leg or arm and this will make the zipper stay in place even more securely.

When adding a zipper to a fully closing foam armor piece, make sure that you don't glue the foam too close to the zipper teeth, because it will also need some space for the zipper runner to move through.

The downside of this technique is that the zippers will be visible. So place them somewhere where they are least noticeable, like on the inside of the legs or on the back of the arms. Or create a piece of foam on the armor that will go over the zipper and hide it visually.



NOTE

Experiment with this technique. You don't have to always glue a zipper right next to the edge of the foam armor piece. It's also possible to combine a foam piece and a fabric piece, just like I did with my Zelda leg armor for example (1,2,3). There's many ways to use zippers with foam armors. Just try it out!



Combining foam with fabric

Sometimes you'll want a foam armor piece or detail to be permanently attached to fabric. This is definitely possible, and there are a few ways to go about this.

How to add foam to fabric

When a piece is just small and not heavy it can be glued onto fabric directly using either contact glue or fabric glue. A type of fabric glue that I personally like to use is the Gutermann HT2 glue. It's a strong glue that can stick various materials onto fabric.

This works great when the fabric that the foam pieces are being glued onto is not (or just slightly) stretchy. Because when the fabric stretches, the glue will stretch with it, but the foam won't and then the foam will quickly fall off. Even if the glue is strong.

Attach foam to stretchy fabrics

For attaching foam to stretchy fabrics it's an option to take a piece of craft foam that has about the shape of the foam piece that you want to add onto the fabric and actually sew that onto the fabric first (2). Use long stitches to prevent the foam being completely perforated. Most sewing machines will be able to sew through craft foam, since it's just 2mm thick and soft. To secure it a bit extra, it's a good idea to glue the craft foam piece onto the fabric with some fabric glue and wait for that to dry first before sewing.

Once the foam piece is sewn onto the fabric, now you can simply use contact glue to glue the foam detail or armor piece onto the sewn on piece of craft foam (3). The attachment won't be visible, but it's really strong!

Of course, it can rip if the thread of the seams will rip the craft foam apart, so I always suggest to not pull on the attached foam pieces too much. Just leave them be and let them be pretty on your costume.

NOTE

A walking foot (1) on the sewing machine can help to make sewing crazy materials like foam and pleather easier because it adds upper transport to the sewing machine. Most sewing machines just have lower transport. But upper transport is really helpful, especially for cosplayers who just sew anything they can find and not just fabrics. Yes, also Worbla. The combination of upper and lower transport (feed dogs) also helps to prevent fabric layers from shifting while sewing and it helps to prevent creasing and folding of the fabric layers. For BERNINA the walking foot is #50 but other sewing machines brands will have their own and there are even universal ones that will fit multiple brands of sewing machines.





Foam inside fabric

Another interesting way to combine foam with fabric is by using craft foam inside fabric to add detail lines or shapes to garments. This especially works great for adding sturdy and thick golden edges to costume parts.

Golden edges

I write golden edges here, but of course the shapes that are made with this technique can be any color. I just often use a golden color for details like these.

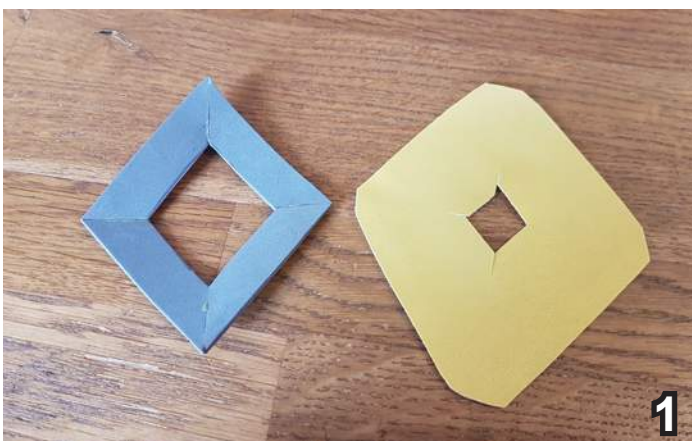
To make these details simply cut the desired shape out of a piece of craft foam. Then use this template to cut a piece of fabric to cover it. Make sure to add an extra centimeter or a bit more of fabric around all edges of the foam and then cut it out (1). Fabrics that are great for this are for example metallic spandex or metallic pleather.

With some fabric glue or contact glue then carefully glue the fabric on the foam and fold the edges of the fabric around the foam and glue it to the bottom so it stays in place (2). When using a super stretchy fabric like spandex, pull the fabric a bit so it will fit snugly over the foam.

Then glue the foam edges that are now nicely covered in fabric onto the garment that they need to be attached to using some fabric glue or contact glue (3).

With a straight stitch on the sewing machine, now carefully topstitch along the edges of the fabric covered foam pieces to attach them securely and neatly to the garment (4). The super neat golden edging is now finished (5)!

Make no mistakes here, because when you have to undo stitches, the holes will most likely stay visible. When sewing these kinds of materials it's a good idea to use a stronger needle, like a jeans needle or a leather needle. Sometimes a universal needle may do the job too, so just try it on a test piece.





Stabilize fabric with foam

Soft foam, like Plastazote or yogamat foam can be used to make fabric details on costumes more stable while at the same time also making it look more bulky/cartoony. The stars and wings on my Pajama Guardian costumes were made by inserting some yoga mat foam that was cut into shape into a 'sleeve' of polar fleece that was sewn in a star or wing shape. I simply cut the shape twice out of polar fleece fabric and sewed it together around the edges. On the back I made a cut in the fleece (1) so I could flip it inside out and then insert the piece of foam that I had cut in the same shape but a little bit smaller so it would fit inside (2). Then I stitched the shapes to the costume by hand (3). The hole in the back wouldn't be noticeable because it was on the back anyway so no one would be able to see it (4).

Use foam for padding in bags

To make bags and purses more stable and to help them keep their shape, some EVA foam or yoga mat foam can be inserted to lay on the bottom (and on the sides) of the bag (5,6,7). Then simply glue it down and then put the lining in the bag.

The foam won't be visible anymore but it will help the bag stay in shape, while still keeping it somewhat flexible. It also helps as padding to keep everything that you put inside the bag safe!





Making foam props

EVA foam is lightweight, comes in various thicknesses and densities and is also easy to shape. Those things all make it really great for creating props with. Even very big and bulky props are possible because the foam doesn't weigh much. With foam you can make props like staffs, swords, spears, axes, bows, wands, daggers, halberds, shields, clubs, guns and even giant teapots, spell books, dragon eggs, tankards and beer kegs.

The props could even be turned into bags, but more about that specific topic in another book...

Prop patterns

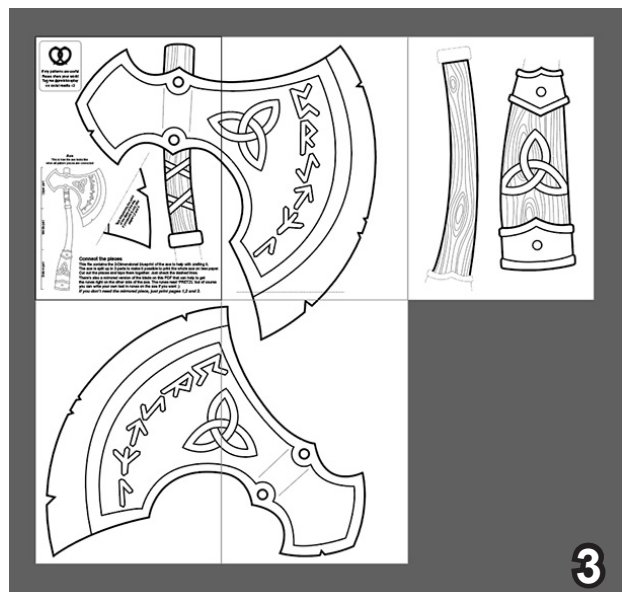
When starting a prop, you'll need a pattern or blueprint for it. I often like to sketch the silhouette of a prop on some 'old' paper (1) and use that to help me decide how big the prop should be to make it look good in comparison with me and the costume that I want to make (2).

For a mostly 'flat' prop like an axe or a sword, you can just draw a 2-dimensional drawing of the prop and use that as a guide for crafting.

In the end I often like to scan my sketch so I can digitize it

and make it more clean (3) and then print it out to have a really neat pattern/blueprint to work from when building the prop. Of course this is an optional step, and I also do this because I want to offer my patterns and blueprints on my website. And for example when drawing a sword that needs to be symmetrical, with a computer program like Adobe Illustrator, it's easy to just draw one half and then mirror it, resulting in a perfectly symmetrical sword blueprint!

But blueprints drawn on paper are perfectly fine too if you just want to create the prop and have no wishes to have the pattern on your computer.



NOTE

Blueprints or patterns for props can of course be made from scratch, but there are also a lot to be found on the internet, made by me or other cosplayers.

On my website www.pretzlcospay.com for example you can find lots of different resources to help you make your own props.



Building the shapes

When the blueprint is ready (either drawn on paper or a printed computer drawing) it's time to decide how to actually create the prop and make it 3-dimensional. The two most used techniques are to either carve a shape into a big stack of foam sheets or to cut pieces of foam in the right shapes so when they are glued together, a hollow, 3-dimensional shape will form. Both techniques are of course good, but you may prefer one over the other. Let's dive into both techniques to find out more.

Layering

Especially for smaller or thinner props, the technique with layering foam and then carving the shape into it can be really useful.

Depending on the desired total thickness of the prop, calculate how many layers of foam you'll need to stack together. High density EVA foam in 1 cm thick sheets is really helpful to create thickness without having to use lots of layers.

Just cut the silhouette of the prop out of 1 cm thick EVA foam a couple of times (1) and glue all layers together with contact glue (2).

Before carving and sanding, give the glued foam some time to fully dry. Perhaps, come back to it the next day. Then take a craft knife and start to cut away pieces of foam until the rough shape of the final prop is visible (3). You can keep carving into the foam and cut small parts away until it is really close to the final shape.

Then take a sanding tool and sand the rough shape smooth. A rotary tool works great, but for larger areas, a triangle shaped sanding tool or a band sander work amazing too! Keep changing the sanding drum/sanding paper on the tool to a finer one until the surface of the foam is as smooth as you want it (4).

Now the foam prop can be heat sealed with a heat gun and it's ready for priming and painting! Depending on how smooth the sanding went and how well the foam layers were glued together, the glue seams can still be visible in the final result. With enough layers of primer or foam filler this can be hidden though.

A foam prop made by using layers and then carving it into shape and sanding it, will be quite sturdy because it has a lot of mass and there are no hollows inside the prop that can be squished.





Works great for smaller props

While EVA foam isn't super heavy it can still get quite heavy when layer upon layer is stacked to create a base shape for a prop. So that's why this technique is especially useful for smaller props that don't require a lot of layers of foam. The low weight of foam is one of the reasons we like to use it right? So why completely sacrifice this by using too many layers? Then, perhaps the other technique to create 3-dimensional props is a better idea. And that's the technique for making hollow shapes out of foam.

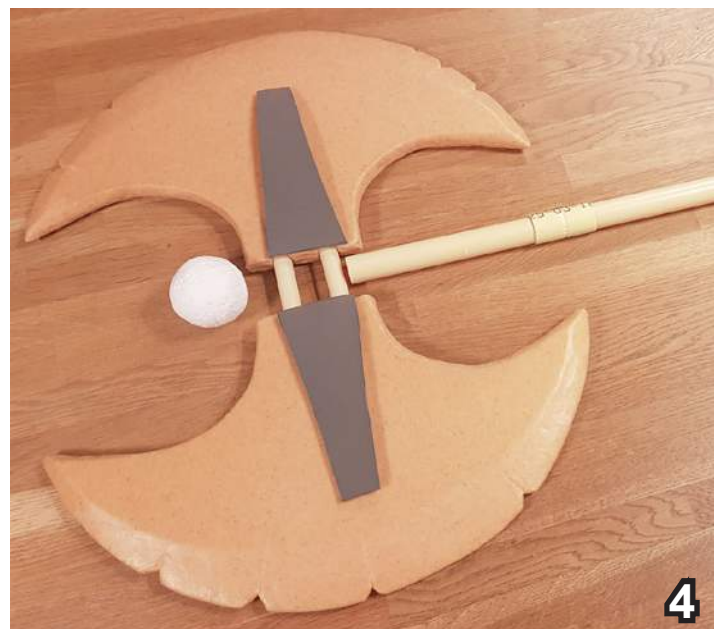
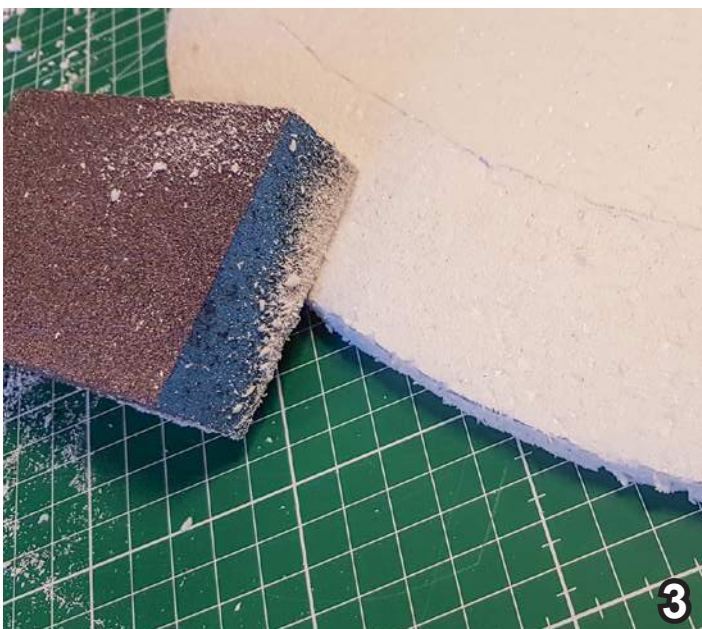
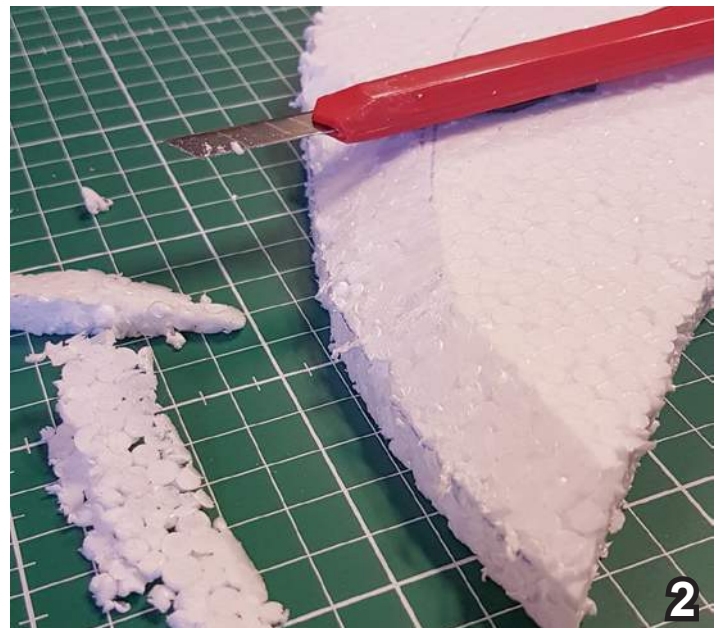
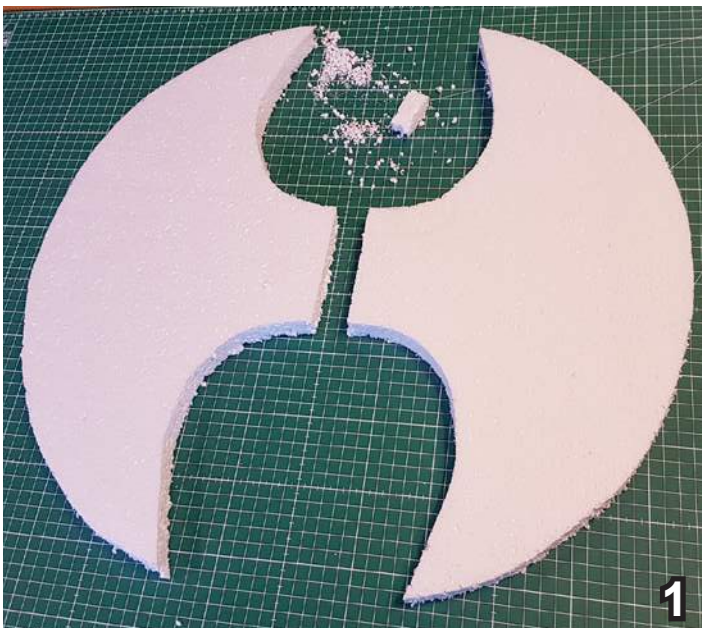
This layering and carving doesn't just work with EVA foam, but also with Styrofoam and expanding foam. These are super lightweight (even lighter than EVA foam) so it can also be used for bigger shapes. Even real big shapes!

Combining Worbla with carved foam

A carved into shape piece of Styrofoam (1,2) or expanding foam can be sanded really easily just with simple sanding paper or sanding sponges (3). The shape can then optionally be covered with a thermoplastic like Worbla (4) to make it a sturdy shape that can easily be painted later. This works great for example for sword or axe blades or even horns. Just be careful when using hot Worbla over Styrofoam or expanding foam because they can melt rather quickly under the heat of the heatgun. So always work quickly when using Worbla over Styrofoam or expanding foam.

Of course, Worbla can be used to cover EVA foam shapes too. It can help to make the shape more stable and it's also a great base for adding details and sculpting.

More about Worbla and how to use it can be found in my book 'The Ultimate Guide to Worbla'.





Hollow shapes

Another way to create 3-dimensional shapes with EVA foam for props is to make hollow shapes. When done correctly, this can look super neat and beautiful, and even big shapes can be created without having to do a lot of sanding.

A bit more tricky

This technique is a little less beginner friendly than the stacking and carving technique because it requires an actual pattern of which the 3-dimensional shape will be built with. And it can be quite tricky to come up with such a pattern. If you have experience with making plushie patterns or even clothing patterns, you're already one step ahead when wanting to use this technique.

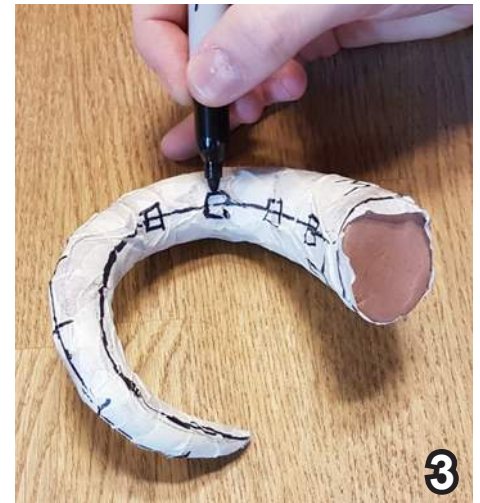
Making a pattern for a hollow shape

A way to create a pattern for a hollow shape is by first sculpting the shape out of clay (1) and then covering this with painter's tape (2) or duct tape and drawing the pattern lines on it (3). Then cut the pattern pieces off of the clay shape (4) and transfer them onto paper. Always make sure to write names or numbers on the pattern pieces, mark which side is 'up' and also make some registration marks between the pattern pieces so you'll always know how to align them later.

Scale it up to life size

If you made a scaled down clay shape (1), you can now scale the pattern pieces up until they are the correct size for your prop. An easy way to scale up patterns is by scanning the patterns into the computer, then tracing them with a program like Adobe Illustrator and then using the scaling tools in the software to scale them up.

First measure the clay shape and decide how big the actual prop should be. Then try to calculate how many times the model should be scaled up until it will be the correct size. For example 1,5 times or even 5 times. Then use that calculation to scale up the pattern pieces in your software and then print them out. This is what I do for my own difficult patterns like for horn shapes or something crazy like a horse head for example.





Using the pattern on EVA foam

The pattern pieces can then be cut out of EVA foam (previous page picture #5). For smaller shapes that require a lot of bending and curving, I like to use low density 5 mm thick EVA foam because it's so easy to shape. For larger shapes I also like to use high density foam in either 5 mm or sometimes even 1 cm thickness.

The last step is to simply glue the pieces of foam together using the registration markings on the pattern pieces to align the foam pieces perfectly (previous page picture #6).

Cutting angles to get sharp edges

When a sharp(er) edge is needed where two foam pieces meet, then make sure to cut the foam at an angle. Then automatically, a sharp edge will form when the pieces of foam are glued together, like at the tip of a horn (previous page).

Use undercuts to create relief

To create a relief in a larger sheet of foam, you can use the undercut technique that was described earlier in this book. Make undercuts on the back of the foam (1) and glue them closed or insert some scraps of foam into the cuts (2) to create a nice relief on the front of the foam (3).

This works great to create shapes that you would otherwise need to carve out of the foam and sand smooth. But now, the surface will look super smooth without even having to sand at all!

If the finished shapes are rather long, you can make it more stable by adding some foam inside the hollow shape that will serve as a core (4). With even bigger shapes, sometimes sturdier materials can be needed like PVC pipes or sticks.





Stability

Since the props made with this technique are hollow, sometimes it will be necessary to put something inside them to help make them stable. With blades of swords for example, a piece of PVC pipe or a sheet of Sintra/Forex can be glued inside it to make it less wobbly. Or it can be filled up with scraps of foam, to make it more solid. Filling it up with scraps of upholstery foam will also keep the final product squishy, if that's desired.

When a hollow shape is quite large and bulky, it can be a good idea to glue some 'walls' of EVA foam inside it that will keep the overall piece in shape. Some parts will then remain hollow, but that doesn't always have to be a problem.

Using resin for extra stability

It's possible to add some quick curing resin into a hollow foam shape and then turn the foam piece around while the resin is curing, which mostly takes only a few minutes. This way, you can create a sort of very rigid 'shell' of resin inside the foam piece. Then your hollow foam shape will stay hollow, but it will also get very stable. Resin can get quite heavy quickly though if you use multiple layers and this material is also quite expensive.

Liquid expanding foam for stability

Pouring liquid expanding foam into a hollow shape will also make it more stable. There's 'FOAM-iT' for example from 'Smooth-On' which expands about 2 to 18 times in size (depending on which version of the product you use) and then feels like normal expanding foam which can be cut and sanded.

Another example of this is the 'house brand' of FormX which is cheaper and expands about 25 times in size. This is the one that I'm using in the pictures #1-4 below.

And then there's also the liquid expanding soft foam from Cosplayshop.be for example which also needs to be poured into a shape in liquid form and then expands about 10-12 times and solidifies into foam. But that one will be more like upholstery foam, so the final foam piece will still be squishy. For big bulky LARP props this can be very useful for example!

These products can get quite pricey though, so they may not be the ideal solution for everyone.



Separating the props

Because EVA foam is so lightweight, it can be tempting to make enormous props with it. But those can be difficult to store or travel with. To make that a little bit easier it's a good idea to make the props come apart in several pieces. I personally like to use PVC pipes and PVC pipe connectors (5) for this purpose. The pipes and fitting connectors can be found in hardware stores. The pipes are easy to cut with a handsaw or a ratchet cutter and the connectors can be glued onto them with contact glue. Glue the connector on one side of the PVC pipe only because otherwise the connection will be forever.

If the prop is quite lightweight, these connectors will be strong enough. If it needs a bit more strength, you can also use two connectors next to each other or heat up the PVC pipe a bit with a heat gun so you can 'widen' it a little bit when it's warm. Then the pipe will fit more snug in the connector and the connection will be stronger.

To add a PVC pipe to a prop, make sure that you measure the diameter of the pipe and leave an opening in the prop where it will fit in. With contact glue the pipe can be glued onto the foam. Now you have a prop that you can take apart (6) and put back together (7) for easy storage and travelling!

It's also possible to work with magnets or even screws to make props come apart. Even the screw cap from an old soda bottle will work as a connection. As long as you're creative, you can find many useful materials.





Details

This is where it gets even more interesting. Further building on the foam creations by adding smaller, more intricate shapes. There are many ways to create details on foam armor and props so let's take a look at some ideas to make your foam crafts even more awesome!



Bevels

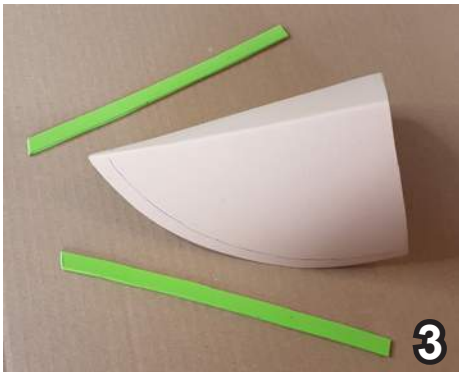
A commonly seen detail on armor are bevels. Bevels look great when used on the edges of armor pieces for example. They can also be used to create detailing lines on the armor itself, so not just for the edging.

Sometimes bevels will be rounded and other times they can be triangular or even square shaped. These all can look really cool, and the techniques to make them are quite similar but just require a few different steps.

Square

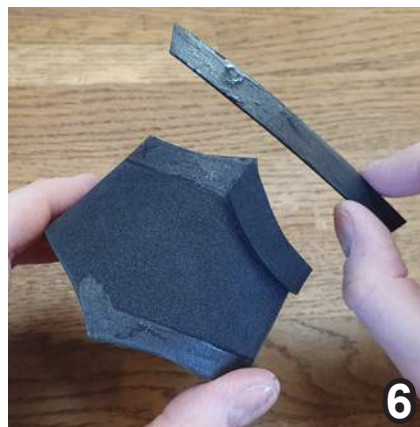
Square bevels are the easiest and quickest to make, since they require the least sanding and also cutting them is quite simple. To make a square bevel, simply cut a straight strip of foam (1,2) and glue it onto the armor piece (3,4,5). Now you can leave it like this, or sand the two edges of the bevel slightly to make it a bit less pointy. Personally, I mostly like how it looks when it's slightly sanded.

The thickness of the foam that you choose in combination with the width of the strips that you cut determines how the bevel will look in the end. Cutting the strip in the same width as the thickness of the foam will result in a perfectly square bevel. But cutting the strip wider than the thickness of the foam will result in a wider, flatter bevel. It's even possible to cut the bevel narrower than the thickness of the foam, which will result in a thin, high bevel.



NOTE:

When you need a bevel in a curve, it's not necessary to cut it in this shape. A straight cut bevel (6) can be glued onto an armor piece on a curve (7) and it will then keep its curved shape. Knowing this already saves a lot of material when cutting bevels! Because you can simply cut straight lines and that way, a sheet of foam can get you a lot of bevels.

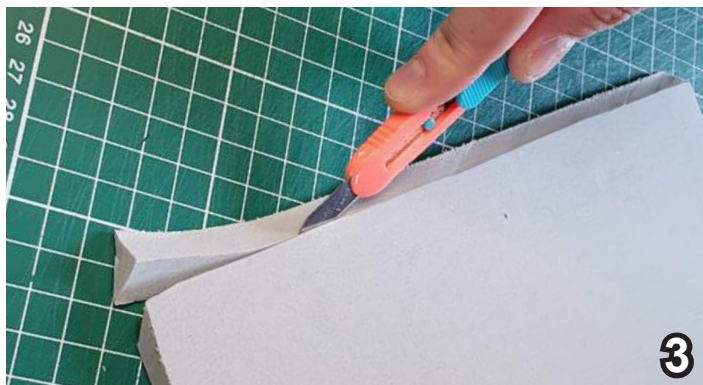
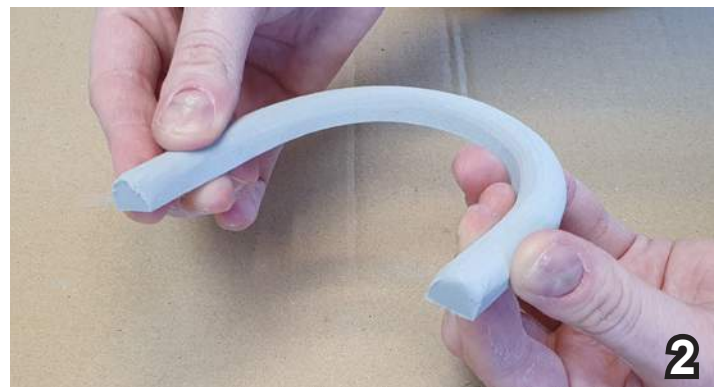
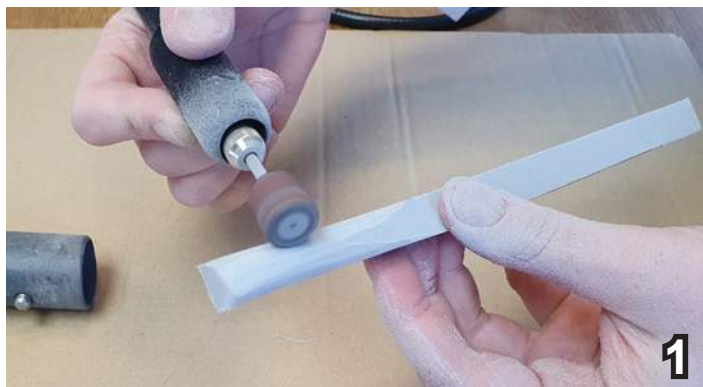




Round

To make round bevels, a bit more work is needed than for square bevels. Making round bevels requires quite some sanding. To make a round bevel, first start with cutting straight strips of foam, like if you were making a square bevel. But then, instead of just leaving it like that, sand the edges until the bevel is round **(1,2)**. With low density EVA foam this will be easier and quicker to do than with high density EVA foam, but of course it's also easier to accidentally sand away too much material because the low density EVA foam is so soft. So always be careful. And if it does happen, just call it battle damage.

You can sand both sides of the bevel before gluing it onto the armor piece or glue it on first and sand it afterwards. Both can be a little bit tricky. When sanding it before gluing it, you'll need to hold the bevel in a way where your fingers will be quite close to the rotary tool while sanding the foam. But when the bevel is already glued onto the armor before sanding it, it can happen that you accidentally sand away material from the armor piece itself too while sanding the bevel. But of course, both ways are good. So just try which one works best for you.



Triangular

Triangular bevels are probably the trickiest to make since it's quite visible when the triangular shape on a bevel is not done very neatly. There are mainly two ways to make triangular bevels. You can either cut the foam already at angles **(3)** so it will already be a triangular bevel right from the start **(4)**, or you can cut the foam strips straight and then sand it down until it has a triangular shape. Both will work but it's kind of tricky to get a triangular shape to look really neat.

The thickness of the foam and the width of the strips that you cut will determine the look of the final bevel greatly.

A thinner, wider cut strip will have a flatter triangular shape while a narrower cut thicker foam will have a sharper, higher triangular shape.

There are even tools that can help to cut foam at an angle to create perfectly triangular bevels. I personally haven't tried those so I can't really give advice on them.

NOTE

Using a combination of square, rounded and even triangular bevels on an armor can make it look really interesting. Using just one type of bevel can sometimes make it look a bit plain. So just play around and find out which types of bevels that you like and which will fit your specific foam project.

NOTE

If you want to detail your armor even quicker then it's a good idea to look for foam prefabs. In cosplay crafting stores many prefabricated foam shapes can be bought such as triangular, square and round bevels in many different diameters. They can get pricey if you need a lot of them, but they are for sure very handy and speed up the armor building process greatly!



Making gems and stars

On some costumes and even props, 3-dimensional stars and gems can look really awesome. These shapes can seem difficult to make at first, but luckily there is a very easy way to create gems and stars out of foam. This technique works both with high density and low density EVA foam, but low density foam is easier to shape in general. So for starting out, I would recommend to use low density EVA foam. Both 5mm and 1cm thick EVA foam will work, but it will be the easiest with 5mm thick foam.

Making stars out of foam

To create a star or gem, you'll first need to make a pattern or download the foam stars and gems templates from my website to make your crafting life easier.

(Let's talk about stars for now, to make writing easier. But the following technique works for both stars and gems.)

To make your own star pattern, draw the outline of the star and add a little bit extra to all the sides.

For medium sized stars, 5-10 mm should be enough to add around the star shape. This extra bit of material will compensate for the decrease in size of the star once undercuts are made in the foam. If you would cut the foam star exactly in the size that you want it to be, it will end up being a bit smaller than you had planned. If you are making large stars, then it can be necessary to add a bit more.

A 3 dimensional star has some 'ridges' and 'ditches' to make it look like a star. To achieve this look, some 'V' shaped cuts and some straight cuts (not all the way

through the foam!) need to be made (1). Where the ridges are needed, a 'V' shaped cut should be made on the underside of the foam. With some contact glue, this groove can be glued shut. This will result in a 'ridge' on the outside of the star.

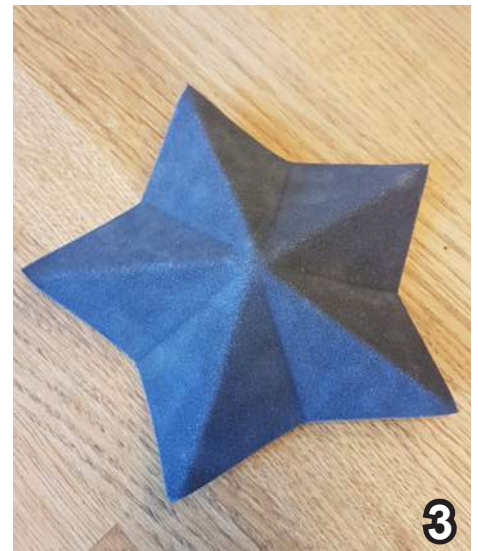
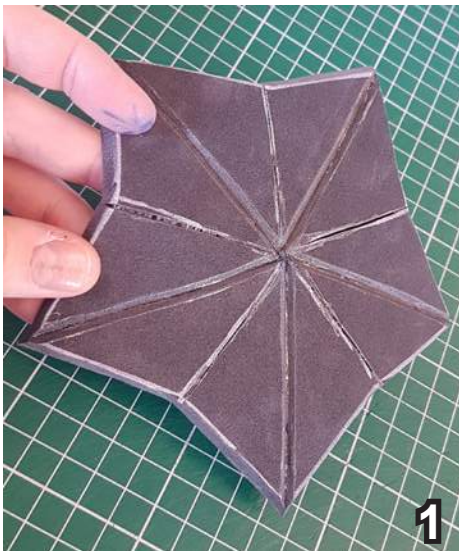
For the 'ditches' between each point of the star, a straight cut needs to be made on the underside of the foam. But be careful to not cut all the way through the foam, because then your star will fall apart. In this straight cut, now add some contact glue and place one of the little 'V' shaped strips that you have cut out from the other parts of the star. Now, the foam will stand open and this will result in a 'ditch' on the upper side of the star.

Placing the different kinds of undercuts in the right places (2) will form a super pretty star (3)!

To make it possible for the star to be glued on a flat surface, make sure to cut the sides of the star at an angle when you cut the shape out of the foam at the start. After gluing the undercuts shut, the angled foam will suddenly perfectly fit on a flat surface. In case you forgot to cut the foam at an angle from the start, you can always sand it after the star is finished.

Making gems out of foam

To make a gem, almost the exact same technique is used. But since gems only have 'ridges' and no 'ditches' you just need to do the 'V' shaped undercuts and not the straight ones. When making a gem with foam, draw the outline on a piece of paper and add some extra to the sides, just like with the stars. Then make the undercuts and glue them shut with some contact glue. Now you'll have a pretty gem that's perfect to add to a prop or costume!



NOTE

To create a full star or gem that looks good on all sides (so the front and the back), just make two of the same star or gem (once mirrored if it's not symmetrical) and then glue both together. When the edges are cut at an angle, this should be quite simple to do. Using low density EVA foam will make this easier because you can force the foam more into shape.



Foam clay detailing

With foam clay, really amazing details can be made. This clay is super soft and easy to sculpt with. All kinds of details can be created with foam clay such as decorative lines, bevels and even faux rivets.

Use foam clay in silicone molds

Foam clay can also be used in silicone molds, so you can get identical pieces of detail for your projects. But this has to be done correctly, or you can get really disappointed. When putting foam clay into a mold, the mold then needs to be placed in the freezer. Let it sit overnight and then take it out. Now the foam clay shape can be taken out of the mold, because it's frozen. Otherwise, it would keep sticking to the mold because there is no air on those places and the clay simply wouldn't cure. But now the shape is out of the mold, it can be left to cure and (depending on the brand of foam clay) it should hold its shape pretty well.

Sculpt bevels and swirly details

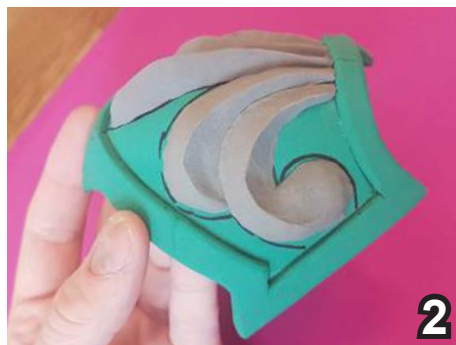
Foam clay can be great to sculpt bevels with and also swirly details on armor (1,2,3). To make it attach better to the armor piece, first dab some water on the armor piece just with your finger. The foam shouldn't be soaking wet, just damp. Then take the foam clay, roll it out so you'll get a long sausage and then apply it onto the armor. Soften the edges into any shape you want so you can get a rounded, straight or even a triangular bevel. You can even play

around with the thickness and the direction of these bevels. After you're done, don't touch it anymore because you can easily deform the details but just put the armor piece aside for a couple of days so the foam clay can cure.

When a swirly detail or even a bevel is really large, it's possible that the foam clay will shrink so much during the curing that it will deform the armor piece or just break off. Then, it's a good idea to indeed break it off of the armor piece and put it aside to cure. Then, when it's fully dry, glue it onto the foam armor piece with some contact glue. It's possible that your detail is now smaller than you wanted, because the foam clay can shrink a bit. So keep that in mind.

Sculpt cute things like mushrooms

Little details like the mushrooms (4), leaves and acorns (5) on my autumn witch hat can be sculpted easily with foam clay. It just works like normal clay. But to add pieces of clay together, it can be helpful to use a tiny bit of water. This makes the clay stick better. For example, to make a mushroom, you can first sculpt the hood and then the stem and connect those two together by dabbing a drop of water on the tip of the stem with your finger. Then press the stem firmly onto the hood and rub a bit around the stem where it meets the hood to secure it better together. Later when the mushroom is fully cured, it can be attached to a foam piece, like a witch hat (6) or armor piece with some contact glue.



NOTE

Get more ideas for sculpting little details by checking out polymer clay sculpting books or watching sculpting videos on YouTube. All shapes can be made with foam clay. Think of balls, spikes, claws, gems, horns and even dragons! Everything is possible, as long as you can imagine it.



Faux rivets with foam clay

Making faux rivets is also a cool thing to do with foam clay and you don't even need a lot of the material for this. Just take a bit of foam clay out of the pot and roll it flat on a piece of cardboard to protect your table.

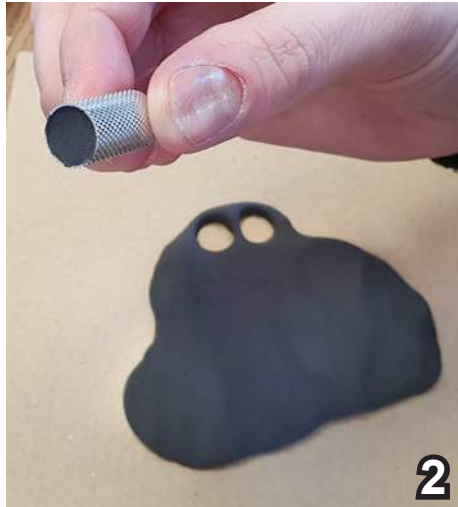
Then find something round that you can use as a 'cookie cutter' (1). It has to be a little bit sharp. I used the cover of my knife sharpener, which is made from metal and is quite thin so it's sharp enough to use as a cutter.

Then use this round shape to cut out little circles from the foam clay (2). This is also why you need to put a piece

of cardboard underneath, because otherwise you can damage your table.

When cutting the pieces, take them out of the cutter (3) and put them aside to cure. Now you'll have a collection of identical foam circles (4) which you can use to resemble rivets.

When gluing the rivets onto the foam armor or prop (5), it's easy to put them on a piece of painter's tape so they won't be going all over the place when you're applying glue to them. Believe me, you'll want to use this trick. It helps to not get the glue on your hands.



A NOTE ON FOAM SCRAPS

When crafting with foam and cutting out pattern pieces for a project, you'll end up with a lot of scraps which are cut away. When the pattern pieces are placed as closely together like a puzzle, you'll end up with as little scraps as possible. Pattern pieces can be placed on the foam in any direction since foam has no 'grain line'. So just puzzle until everything fits as economically as possible on the foam sheet.

Eventually foam scraps will need to be tossed away and they will become waste. To make the most out of the scraps and throw away as little as possible, it's a good idea to keep a box with larger scraps, and go back to that box each time you're starting a new project. Perhaps some pieces are big enough for parts of the project that you're making. Some scraps may be perfect to use again as detailing on projects for example. Little scraps can also be used as a 'spatula' for spreading out contact glue on foam. And it's even possible to use scraps that are cut into little pieces as stuffing for larger hollow foam projects.



Creating details with EVA foam

Details can also be created by cutting a shape out of an EVA foam sheet and then sanding it smooth. When sanding the foam to be super smooth, it's better to use high density EVA foam. This will give a much smoother result after sanding than low density EVA foam would.

For most details, 5mm or 1cm thick EVA foam will be just fine. But if you want even higher raised details, then you can glue some shapes that are cut out of EVA foam sheets on top of each other to create a thicker piece **(1,2)**.

Before sanding the detail piece smooth, it's a good idea to already carve the rough shape in the foam with a sharp craft knife **(3)**. You can use the same knife that you also use to cut the foam sheets, just make sure to sharpen it often. Doing a bit of carving in the foam will help reduce

the amount that needs to be sanded off with the rotary tool later.

The detail piece can now be sanded to refine the shape more and to smoothen the surface. A rotary tool is great for this **(4)**, since it has small sanding tips that are easy to guide over the foam.

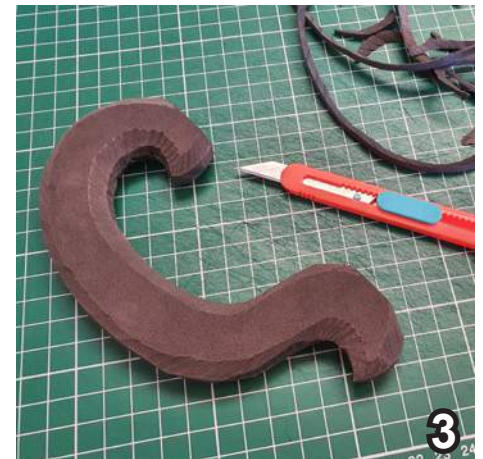
Sometimes it may be tricky to sand a detail piece because it can be rather thin and small, which can make it difficult to hold and sand at the same time. If the detail piece is too small to hold and sand, it's also possible to first glue it onto the armor piece or prop where it is needed and do the sanding afterwards. This will make it easier to sand because it doesn't move around anymore, but it also makes it more difficult to reach all the nooks and crannies. Some places might not be reachable anymore to sand after it's glued down already. It's now also possible to accidentally hit the armor piece or prop itself with the sanding tool, and create unwanted damage.

Of course you can always solve this by calling it battle damage, and by adding some more scratches and dents on other parts of the armor or prop as well **(5)** to make it look more real.

While the detailing might already look really smooth after sanding, it can still be made to look even smoother by heat-sealing the foam. Just blow some hot air over it with a heatgun **(6)** and then rub over the foam to flatten the surface a bit. You can use your hands (be careful when the foam is hot) or even a butter knife or your table's surface to rub over the foam and smooth it out.

Heat-sealing doesn't do just this trick, but it also closes the pores of the foam to make sure that it won't suck up paint like crazy anymore.

After all this refining work, the detail can be glued to the project.





Painting

After all the designing, crafting and sculpting is done, it's finally time to add some colour to your project and bring it to life. But before the paint can be applied, it first needs to be primed. Priming and painting foam may seem daunting at first (believe me, it scared me too!) but when you know which materials to use and how to apply the paint, it will make your foamsmithing life a whole lot easier!



Painting foam

After the foam is heat sealed, it can be primed and painted! And yes, don't skip the heat sealing step, because it really helps with closing the pores of the foam.

For painting a foam project, there are basically 3 steps which are important.

The 3 'P's are: Priming, Painting and Protecting.

First step: Priming

It's important to do the steps of painting in the right order. So priming first, to make sure that the surface of the project is fully covered and the pores of the foam are sealed.

When skipping this step, you'll find that the foam keeps sucking up paint when it's applied. And it feels like it's just impossible to cover the foam with a nice layer of paint. Somehow the pores will stay visible when painting directly over 'raw' foam. After several layers you might even give up on foam crafting. Believe me, I've been there when I started with foam, so I want to warn you so you can get the most out of this material.

For priming the foam you can choose between all the different primers that are described in the first part of this book (materials and tools). There are of course even more materials available, I just haven't tried all of them yet, so they are not all in this book.

Flexible or non flexible primer?

To help pick the right primer for your project, decide if the foam piece will need to be able to flex after it's painted. If the answer is yes, then a flexible primer is a must. If the answer is no, then a non-flexible primer like PVA primer or wood glue is perfect.

PVA primer gives a really smooth surface (smoother than the flexible primers!) and it's really easy to apply with a brush **(1)**. To achieve the smoothest result with PVA primer, start with painting one layer of the primer with a brush. Then after it's dry, paint another layer of primer which you've added just a bit of water too, to thin it down a bit. This will make the primer self-level even more. Then for the third layer, apply primer that has a bit more water mixed into it. This may be enough for a really smooth surface already **(2)**. It's also possible to apply the PVA primer undiluted onto the foam and then, when it's still wet, gently stroke over it with a wet brush to thin the layer of primer and to make it self-level more. When adding more water to the primer, also be careful to turn the foam project around several times when the primer is drying because you want to prevent drips as much as possible.

When the final layer of primer is dry, you can start painting the foam project.





Using a flexible primer

When you chose to go for a flexible primer, you can pick a spray primer or a brush on primer.

Flexible spray primer

The brush on primers are more beginner friendly while the flexible spray primers can be a bit more tricky.

To use the spray primer right, it needs to be applied in thin, even layers. It can be tempting to spray thick layers, but this won't look really good in the end when it's dried. Sometimes air bubbles can form in the primer and those will show up when it's dry. So spray thin layers and let it dry before you spray a second layer on top. Mostly you'll find that you need about 3 layers of flexible spray primer.

When done correctly, this primer gives a smooth surface. You can see the difference between unprimed foam (1) and foam sprayed with 3 layers of flexible spray primer (2). The surface looks nice and smooth and evenly black.

Most flexible spray primers dry rather quickly, so if you have a whole armor set to prime, the first piece is probably

already dry once you've finished the first layer on the last armor piece.

Working with flexible spray primer requires good surroundings. Don't use it indoors if you can't ventilate the area well enough or if you don't have enough space. It's a better idea to take it outside then and do the spray painting over there. Always wear the right protection when using spray paints. So wear a mask that will prevent the tiny drops from getting into your lungs and wear safety glasses to protect your eyes. You can also wear gloves.

Flexible brush on primer

A flexible brush on primer is really beginner friendly and also just very convenient. Flexible primers like Hexflex are nontoxic and non-smelly so they can be easily used indoors. These take a bit longer to dry than the spray versions, so you may have to wait a little longer between coats of primer. I personally mostly apply 2 layers of Hexflex primer onto foam, but sometimes 3 layers, when I want to smooth out some areas more. To get a smooth result and no annoying visible brush strokes, I recommend to use makeup brushes. Those have soft bristles which leave nearly no brush strokes on the paint job (3,4,5).



NOTE

Of course you can always use flexible primers, even if the project doesn't need to flex after it's painted. So in the end it's all up to you which primer you'll pick for your project.





Second step: Painting

Painting is the second step, which needs to be done after the primer is dry. After the foam is primed, you can use practically any type of paint over it. The foam won't suck up the paint anymore, and you now have the surface of the primer left to work on.

Choosing a type of paint

Before you choose the paint that you want to use ask yourself some questions. What does the foam piece that you want to paint need to look like? Does it need to look like metal? Or something organic like wood? Does it need to be glossy or matte? Do you want the surface to be super smooth or do you want it to be rough? What you answer on those questions can help determine which paint to use. For a project that needs to look like it's made with metal, gildingwax can be a great option. If the metal needs to look super shiny and new, perhaps a chrome spray paint is a better idea. Paints also have either a matte or a glossy finish, or something in between. The finish of the paint can make a costume piece look totally different.

Shadow color

If you want to paint something in a metallic color like gold, silver or bronze then this is the moment where you may want to add a shadow color to your project.

Metallic colors all have a color temperature. Silver for example is cool and gold is warm. Shadow colors can be black or brown for example. Black is cool and brown is warm. So for a silver project, black would be the perfect choice (1). While for a golden or bronze project, brown is a better option. When using the right shadow color on your project before painting it with a metallic color, it will look more natural and more realistic.

Metallic paints sometimes are less covering than other colors, so it may be necessary to apply multiple layers to get the desired effect. If you start by painting an armor piece that needs to be silver first completely black, then you can paint some layers of silver over it. The paint gets brighter by adding more layers. This can be used to achieve color gradients without even needing to add shading.

Just start by painting the whole armor piece silver first (2). If you use an acrylic metallic paint then it will most likely not be fully covering in the first layer. Then with the second layer of paint (3), just paint in the middle of the bigger surfaces and on the raised details. Now they start to stand out more. In the next layer(s) keep painting in the middle of the surfaces but each time a bit less. And do the same for the raised details. This will make the color gradient from dark to light even nicer and this can really bring out the details in the project (4). Of course this works for other colors too, not just for silver.

NOTE

While you can perfectly use acrylic spray paint, it happens often that this kind of paint chips/ cracks when it's used on foam, which is a flexible material. This isn't always a problem, but it's definitely something to keep in mind when you are choosing which paints to use for your project.





Each layer a lighter colour

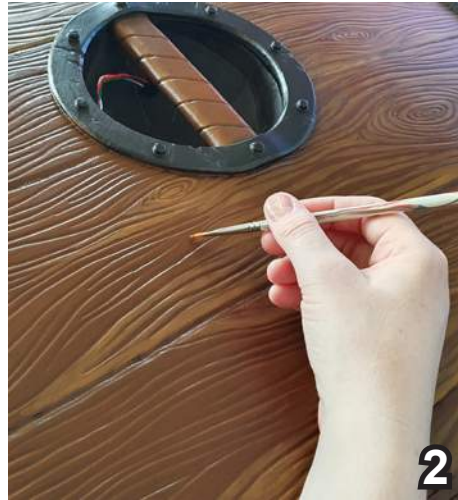
For painting a woodgrain texture for example, a similar technique can be used.

First, paint the whole piece of 'wood' dark brown (1) and then keep painting new layers over it with a lighter shade of brown for each layer. When doing this, use a small brush to paint with the lighter colors over the woodgrain lines (2,3).

This will really bring out the details that you carved in the foam earlier. When doing this and taking the time to do the

painting with care, all the time that was needed to do the foam carving was worth it!

Of course it's also possible to start with the lighter colors first. For a very bright project, a light color like white can even be perfect for the base. This can bring out bright light colors even more. But light colors (especially with acrylic paint) can require quite a few layers of paint to be applied before an even color is achieved. With spray paint, this is of course much easier and quicker.





Bonus step: Highlighting and shading

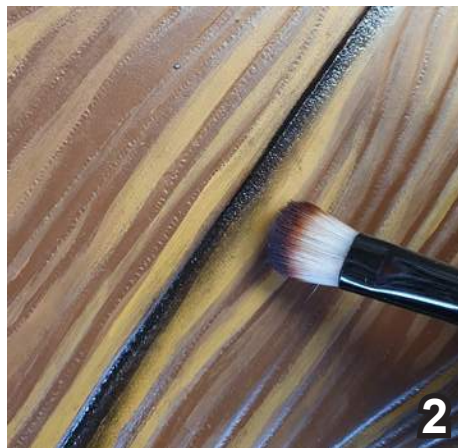
Another step in between the painting and protecting steps is highlighting and shading. This step is optional but definitely also recommended to get a really nice looking end result. Even if you have built up the paintjob with multiple layers and made gradients that way, it can still look even better when some additional shadows are added.

To make raised details stand out even more, you can paint some darker colors on the edges, right next to the details. Make sure to pick a color that's clearly darker than the overall color of the piece, otherwise the shading won't be visible. Always start with a bit of paint and see how it looks. It's easy to accidentally apply too much dark paint around the edges and that will just darken the whole project and it may take away most of it's color. So just start with putting a tiny amount of paint on your brush and applying it in the

corners (1). When using acrylic paint, be quick with shading because the paint dries fast. Using oilpaint will allow more time for the blending (2) of the paint and for creating the gradients since this paint has a very long drying time.

Highlighting works similar, but obviously it's done with light colors instead of dark colors. On raised details on armor pieces or props you may want to add some additional highlights to make them stand out even more. This can be done with white paint for example or a lighter version of the color that's underneath, like lilac on top of purple. But just put a tiny bit of paint on the brush and then drybrush it onto the project (4). Or dab really softly to just apply a bit of paint. For even brighter highlights, keep adding more layers that are even lighter each time (5,6).

On gold colored pieces, highlighting with silver can also look quite nice. Highlighting with white on metallic pieces can sometimes look strange, because the white paint is not metallic.



NOTE

To make super harsh shadows and highlights that almost look cartoony, it's also possible to paint thin lines with black paint around the raised details and white lines on the edges of the details. This will make them stand out more, and it can look really good. But it's a very specific look which you may not like. It can be tricky to paint these lines with a brush, so another easier option is to use paint markers for this. I like POSCA paint markers for example because they have a good coverage, even on dark colors.



Final step: Protecting

After the paintjob is done, it needs to be protected with a final layer of varnish. Depending on how shiny you want the piece to look, you can pick a varnish that has a matte, satin or glossy finish.

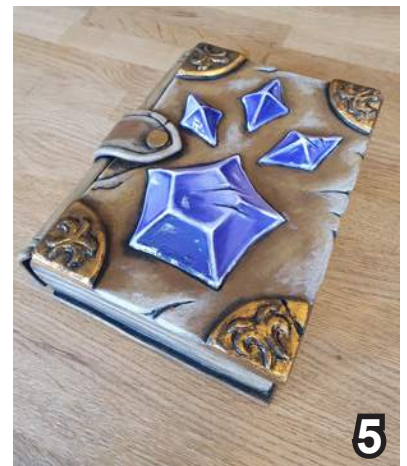
It's all about that final layer

Acrylic spray varnish works really easily, and you can just simply spray the whole piece with this protective colorless paint. On armor pieces I often use the spray varnish with a satin finish. This is in between matte and glossy and I find that it looks quite realistic for metallic armor pieces. For something that needs to stay matte, of course a varnish with a matte finish is perfect (1). This is great for protecting a paintjob that looks like woodgrain, bone, fabric or leather for example. For super shiny objects, use glossy varnish (2,3).

Also in brush-on varnishes, there's a range of finishes to choose from like matte or glossy (4,5). So both of these can work just fine, depending on if you like to use spray paint or if you prefer to paint with a brush.

While acrylic varnish will work well for lots of projects, sometimes you will want to use a flexible varnish like Plastidip spray or Hexflex clear. For a foam project that will need to stay flexible after painting, it's a good idea to choose a flexible finisher. Plastidip is easy to spray and if you choose the colorless variant, it can work as a varnish for your paint job.

Hexflex clear is a colorless flexible paint which is super easy to use. Just paint it over your painted foam pieces and leave it to dry (6). The finished surface won't be tacky and it dries translucent (7). Don't be fooled by the color in the bottle! Hexflex clear is white in the bottle, but it dries translucent. So no worries.



NOTE

If you are in a hurry, and you just did some shading on your project with oilpaint but you want to finish the costume as soon as possible, then it's the best to use a spray varnish. This will keep most of the oilpaint in place and it will make it possible to touch the armor again after the varnish is dry. The still wet oilpaint underneath won't smudge anymore. If you would use a brush on varnish, then the oilpaint will smudge all over the place and you'll end up with a rather dark colored project.







Some practical tips

These tips somehow didn't really fit into a specific chapter of this book, but they are still quite handy. So I didn't want to leave them out.

Storing foam armor and props

When storing foam armor always make sure that the armor pieces can stay in their correct shape. Give them enough space so they won't be crushed or folded. If an armor piece is pressed flat because lots of things are laying on top of it, the piece can stay in this warped shape when it's taken out of storage again after some time. Sometimes it can work to heat shape it again but this doesn't always work. Quite often the paintjob will be destroyed when doing this. So better be safe than sorry and give your foam armor parts the space they deserve.

If you happen to have some mannequins around the house, it can also be super cool to dress them with your costumes that have big foam armors. This way, the armor will stay in the right shape because it's on a 'body' and it also looks super cool as room decorations!

Wouldn't it be cool to have foam knight armors in the entrance hall of your house..... I'm imagining that it will look totally awesome and will surely turn some heads!

Storing foam props

EVA foam is flexible, so props made with foam will always stay more or less 'squishy'. Even if multiple layers of PVA primer or wood glue were used to make the surface rigid, underneath it is still the soft EVA foam. So when a foam prop is stuffed into a box with other items on top of it, it can deform over time. And shapes can be pressed into it like stamps if heavy items are laying on top of the props. Bigger

foam pieces can also bend because of a combination of gravity and heat. So always make sure to store your foam props properly so they will stay in their original shape. Give the props the space that they need so they will stay pristine.

When a prop can be separated into several pieces, these may fit into a box. If your costume that you're storing in the box with the prop has fabric parts, then use these fabric pieces as cushioning for the foam prop (parts) so they won't deform over time.

Don't store foam props directly next to faux leather items because over time they could stick together and when you then want to take it out of the box, the paint from the prop could be stuck to your faux leather piece. Not a good look. So it's better to have more soft fabric against the foam props if they are stored in boxes. Like perhaps a skirt of the costume, or a cape (if not made with faux leather). I sometimes also put the wig for the costume in between so it can work as cushioning.

Foam props can of course also be stored by putting them against a wall, like you would do with a broom for example. Just make sure that you put something like a mat or a carpet underneath as protection for the material.

A really cool way to store foam props is by hanging them on the wall and creating a prop wall, or just simply decorating your house with props everywhere on the walls. This way, they always have space around them and they won't be squished and deformed.







Wearing foam armor

Some practical tips which can come in handy when actually wearing the armor pieces that you have created after learning all the techniques from this book.

After all, you're a foam wizard now!

Sweating

Foam is soft and therefore foam armor pieces will mostly not have sharp edges. This makes them quite comfortable to wear on your skin. But I do advise to not wear the armor parts directly against your skin because foam doesn't breathe and the skin underneath will start to sweat quite quickly. Yes, even in winter. Foam just doesn't breathe. To still be able to wear foam armor, it's a good idea to always wear some fabric that's breathable and that can absorb sweat underneath the armor piece.

Sew a shirt **(1)** to wear underneath a breastplate and shoulder armor for example or sew some armcovers **(2)** for underneath bracers. If you use fabrics that are washing machine safe, it's super easy to just throw these garments into the washing machine right after you have worn the foam armor.

If there's also some sweat on the inside of the armor parts, just wash it clean with some soap and water. It can be a little bit more tricky than it is to wash Worbla armor clean, because obviously foam has pores that can suck up liquid.



Squeaky sounds

Foam armor can make crazy sounds especially when it's painted and when different armor parts are rubbing over each other.

For example this happens when layering armor pieces on the shoulders/arms and on the legs/knees/feet.

I haven't found a way yet to keep foam armor that rubs over each other from squeaking, but it can definitely help to think about this first when creating the armor patterns and armor. Maybe it's possible to create the pieces so they don't touch each other while wearing them. Or glue some fabric over the foam where it will move across another foam armor piece to prevent the squeaking sounds.

Believe me, it's kind of funny and also a bit awkward when you walk around a convention and sound like a big walking dog toy.





Thank you for reading this book!
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