The Book Of Cosplay

- Armor making -

with Worbla and Wonderflex

by Svetlana Quindt

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DEAR READER,

Firstly, congratulations on your decision! It's easy to fall in love with the detailed and stunning artworks from World of Warcraft, Diablo, Skyrim, Mass Effect and so on - but it really takes courage to take heart and start with such a huge cosplay project.

Secondly, thanks a lot for ordering my book! It is always a pleasure for me to help and inspire other cosplayers and costume designers and it means a lot to me, to also get something in return from you guys.

First, a quick reminder:

Creating an armor costume is not the easiest way to look cool at a covention. In addition, wearing an armor is also not the most comfortable you will feel at a convention. Planning, building and presenting such a costume requires time, money, a lot of effort and especially characters with a huge full body armor will wear you out faster than you can imagine. Apart of that, the final result will fill you not only with pride, you will also learn from it, you will hone your skills and you will clearly be one of the cosplay highlights at every event. So, prepare not only for huge glory, tons of photos and many likes on your facebook page, but especially for torturing your bank account, for sleepless nights, and long crazy days preparing for your upcoming armor debut.

May I introduce myself?

Just jump forward if you already follow my work and know every little detail about me - which is kinda creepy I must say. For everyone else: I'm Svetlana Quindt or Kamui as more of you know me by and I come from the beautiful country of Sauerkraut and Bratwurst: Germany. Around 10 years ago I discovered cosplay as a truly wonderful and creative hobby. Over the time however I learned to hate my sewing machine and exchanged it to a hot air gun, scissors and glue. Now I'm a full time armor and prop maker and mostly known for my armor costumes from World of Warcraft, Diablo and Starcraft. Many of you may also have found this book through my tutorials, which I love to share with others. In my opinion cosplay is a community which grows by sharing knowledge and experience from every member and since I learned so much from others, I want to give something back.

About this Book:

A few years ago many of you already asked me for a book and I sadly never had the time to make one. Now it's finally done and I hope it will be everything you wished for. My main goal is to have a collection of books for all topics that are important for the creation of armor and props. It's supposed to be a guide that helps you during your own projects and that can assist you, if you have any problems or questions. It won't be a step by step instruction for every single bracer, every breastplate, every helmet, every shield, every shin armor and every pauldron you ever wanted, have and will have in mind. That would be just impossible since there are countless amounts of references you can bring to life. But it will give you an idea of how to solve something by yourself.

I will try to give you a helping hand, show you my own techniques and methods I've learned over the years and hope, that this book will be just the beginning for a big project you have dreamed about for years. I know that there will still be some unanswered questions, but I like to open your mind to new ideas and help you to find a solution by experimenting, trying and learning by yourself.

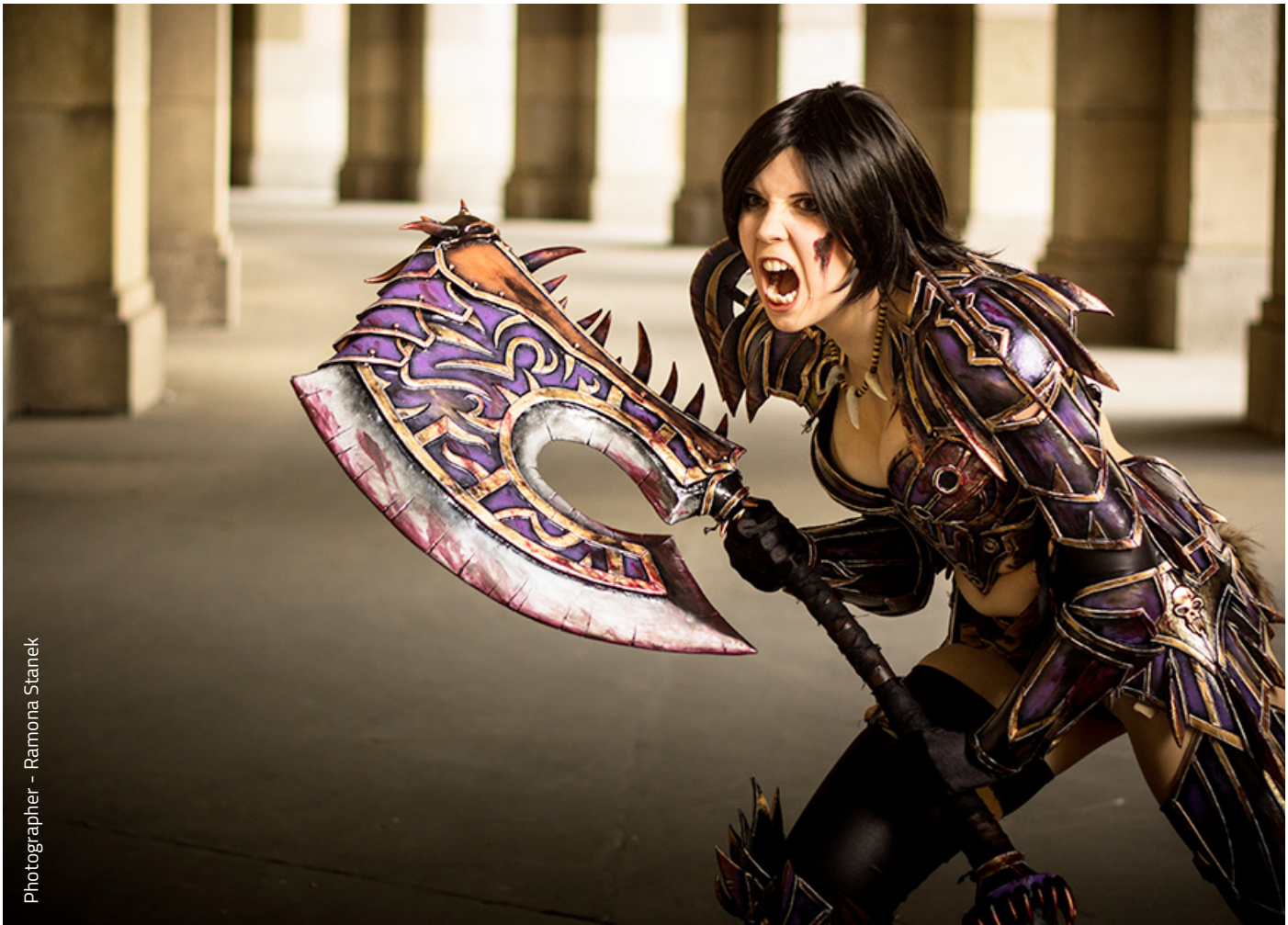
And if you still have a problem, you know how you can reach me!

www.kamuicosplay.com

www.facebook.com/kamuicos

www.twitter.com/Kamuicosplay

www.youtube.com/mogrymillian



Photographer - Ramona Stanek

Content

Material definitions, also known as: ‘Oi! What materials do you use?’

(Yeah, I get that a lot.)

WORBLA

WONDERFLEX

Nowadays thermoplatic materials like Worbla also known as Worbla's Finest Arts and Wonderflex have become very popular in the cosplay community and they are especially known as a great source for huge armor costumes. You can order it from dozens of online shops all over the world and comes in sheets of different sizes. Worbla's standard size and most effective is the XL sheet which has a size of 100cm x 150cm (39.25"x 59") and costs around 80$ each. In average a complete armor consists of 2 to 6 XL sheets. But this depends on the skill of the creator as well as the costume choice.

Photographer – Jakob Schwarz / Janina Quakenack

Huge projects like that seem to be very pricy by using Worbla compared to EVA foam for example. The result however will be very sturdy, durable and with the right care will still look like a new costumes even after many many conventions and photoshoots. In addition, damages can be repaired very easily, fast and with a minimum of tools.

The material itself is very simple to handle. By heating it up with a regular hot air gun it becomes flexible, soft like fabric and releases a glue that makes it stick to itself. By cooling it down again it stays connected to other parts and keeps the shape you formed it into. Once heated up it can be reshaped again and again and leftovers can be used for smaller parts or can even be sculpted like a very rough sort of clay. ■

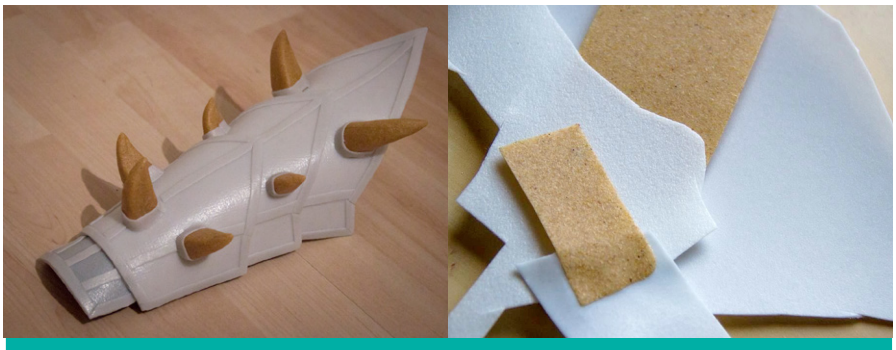
Note:

The Barbarian is one of my most comfortable costumes, which is the reason why I wore it for over 20 convention days already. It traveled to several countries over the world and it suffered a lot of squishing with other costumes in my suitcase.

Despite of that, the durability of the armor material gives the costume a look like it's brand new. Worbla seems a very expensive material, but if you spend around 300 hours on a costume I guess it's worth it for having an almost unscratched costume even after 10 years!

Dragon sculped with leftover Worbla.

Some nice additional materials, which cooperate greatly which Worbla are Wonderflex and Friendly Plastic. Wonderflex also comes in sheets and can be used for armor costumes. In contrast to Worbla it has a fabric structure inside, which makes it more durable and stable. However, it's also more limited in its use, since the flexibility is bound to the grit inside. While you are able to tear apart Worbla easily in its heated form, you can't do the same with Wonderflex. Like Worbla and Wonderflex, Friendly Plastic can also be used in similar ways and needs high temperatures for activation. This material comes in the form of pallets and becomes very sticky once it reaches the right temperatures. Since it behaves like a clay in this form and sticks directly to Worbla and Wonderflex, it's a great material to use for three dimensional and sculpting work.



Note:

You don't need any glue for projects with these materials. Once reaching the right heat, their surface gets sticky and it's easy to connect several parts just by direct contact and a bit of pressure. However, it's always necessary to heat both parts and not only one, since the connection then would work only temporarily. On the other side this effect is helpful for testing different constructions.

Note:

Worbla is a thermoplastic material which needs around 70°-80°C (~167°F) of activation temperature. However it can already deform by lesser heat. A longer exposure of 40°-50°C (~113°F) can be also enough to activate these materials. Just don't store your armor in the back of your car during the summer and avoid long convention days outside in warmer regions like San Diego or Death Valley.

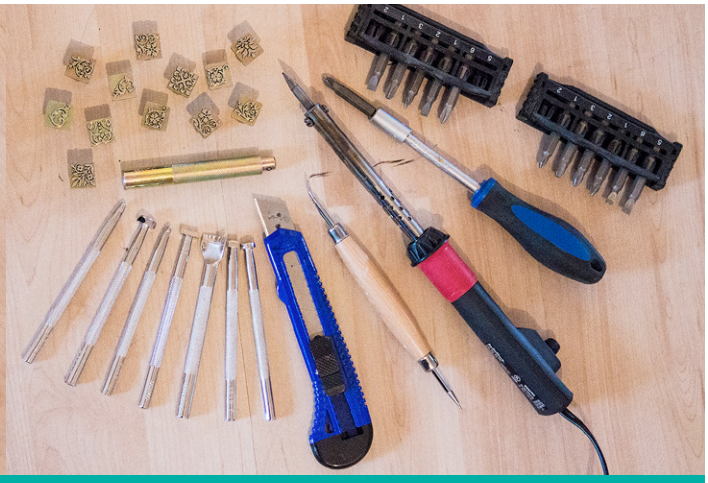
When to use which material?

Wonderflex and Worbla are very similar in their abilities and you are able to create most things with either material. Wonderflex however will often show its fabric grid at cut seams, which makes it difficult to use for detailing work with thin stripes like I do with Worbla. In addition you are not able to sculpt it after squishing the leftovers together. Despite of that, you can use it for many basic armor builds and big armor parts of your costume. Also both materials still have possibilities that I haven't discovered yet and why it's worth to keep experimenting with them. ■

Required tools

For a project with Worbla you will need only two tools. Good, sharp scissors and a hot air gun. I prefer solid leather scissors for my projects since they are able to cut even several layers of material and are easy to get sharp again. For choosing a hot air gun: It's already good enough to buy a very cheap and simple one from the Home Depot. However - if you plan a bigger project or just want to get a quality tool which helps you not only for some weeks or months it can be better to spend more money. Despite of that, it IS possible that you'll destroy several of these tools if you work with them very extensively on these materials.

I use it daily and therefore kill one hot air gun every three months or so.



In addition, different heating tools like soldering guns or hot knifes can be used for detail work or carving. Metal tools for wood or leather working like screwdrivers (not the sonic ones!) or leather stamps can also be heated up and used for different kind of detail work.

If you also wish to increase your work speed it can be very helpful to use several heat guns or even an iron. But be careful - a working method like that needs full concentration and some experience with the material. Also make sure to save your working table from sticking by using wax or putting patchment paper at the top and the bottom of the Worbla when using an iron. You'll also sometimes find notes about heating Worbla with hot water, but since the base of the material is wood it will absorb the water and will most likely loose it's original clean structure. ■

Caution:

Working with heat means that sooner or later you WILL burn yourself. To avoid that I suggest to work with gloves or to dip fingers or the whole hand into cold water before touching the material.

Also, be careful with the hot metal of your tools. I've already worked with these materials for years and many people ask me, why they never see me in gloves: Well, I just became used to the heat and despite of that, I already collected many scars which I just see as a part of being a cosplayer. What would life be without a little danger, eh?

Preparation

Before you start with your costume you need to order some required materials. Depending on where you live you can choose from several online stores who sell Worbla and/or Wonderflex:

Europe:

www.mycostumes.de
www.manga-mafia.de
www.usedconfusion.com
www.coscraft.co.uk
www.cosplaydreams.nl
www.faraos.dk
www.silikonycz.cz
www.kobracastart.com

USA:

www.worbla.com
www.cosplaysupplies.com
www.yayahan.bigcartel.com

Australia:

www.amcsupplies.com.au

You'll find a more detailed list of vendors on the following page: www.cast4art.de/partner.php

Just be extra sure to order enough Worbla and craft foam. To get an idea how much is 'enough' for a costume you can just check out the following image:

As you can see, you'll need around twice as much Worbla as you need craft foam. So basically you can just create the patterns you need for your costume and use these pieces as reference for your material order.

Also check these stores for Wonderflex and Friendly Plastic/Worbla's Deco Art (German equivalent product). In addition you'll need craft foam for the sandwich method (see page 15), Velcro tape, D ring buckles and strings for the attachments.

Velcro tape, D ring buckels and strings can also be ordered online. It's usually hard to say which sizes of buckels you'll need, but since it's nice to have many variants and their price is pretty low it's not bad to order just a few of every size and to check later which ones you prefer.

The best thickness for craft foam is 2mm (0.08") or 3mm (0.12"). You can also separate between main armor pieces with 3mm and detail parts with 2mm craft foam inside. On ebay and several other online stores you'll find craft form not only pretty cheap, but also in large sheets which saves you from wasting material. Notice that craft foam is a main armor material which you'll use a lot and need for every costume piece. ■

This set was made out of 4 sheets of Wobla.

Wonder Woman however cost me only 3 sheets.

The amount of required material depends not only on the costume itself. It's also a question about what skill and experience you have, the amount of detail you want to achieve and your overall reference.

To give you a help I can tell you that my big full armor costumes require around 4 XL sheets of Worbla and smaller ones around 2.5 or 3 sheets. Despite of that, it's always better to order more than you really need, since mistakes and problems always happen and ordering more material takes additional time and shipping costs. A lack of materials in the final stage of your project can also be the reason why your costume won't be done in time. In addition you'll surely use the leftovers sooner or later for another project and so you won't waste money by ordering a bit more than you really need. ■

How to create armor patterns yourself

Creating patterns is one of the most important work steps in armor making. Patterns are not only the base for your future pieces, they also define the shape and the size of those pieces. Well made patterns are the start of a well suited, 'comfortable' armor and are milestones which guide you through your entire project. Basic patterns for bracers, breastplates, shin and leg armor can also be reused for future projects and don't need to be drawn again and again. However be sure that every pattern you create is only for your own body and probably won't work for anyone else.

There are three different kinds of patterns: direct patterns, loose patterns and free patterns.

Direct patterns

Direct patterns are patterns that are the base for a tight armor part and copies exactly the size of a special part of your body. With these patterns you are able to create perfectly fitting breastplates, bracers, shin and leg armor. The way to create them is also very simple and fast:

1 All you need is plastic wrap, painter's tape, scissors, a thick black pen and a part of your body (still attached). In this case I used my arm.

2 Wrap the desired body part in plastic wrap until it's fully covered. Please be careful with wrapping your head for a helmet pattern.

3 Cover the wrapped area with painters tape until you have a thick enough layer that you can draw your patterns on.

4 Draw your pattern according to your reference picture. This needs a bit of practice but you'll get better quickly.

5 Use the scissors to cut out your drawn pattern. You can also open the wrap completely first and cut out the pattern afterwards.

6 Transfer your new pattern onto craft foam and there you go: You just created a pattern by yourself. Congratulations!

It's also recommendable to transfer patterns to some newspaper first and mirror them on both sides for a clean shape. That way several patterns can be also be tested and mistakes with expensive materials can be avoided.

Use thick paper/cardboard and tape to simulate the shape of a whole armor before you actually build it. Patterns are a great orientation to find out how much material is really necessary for a project.

Loose patterns

Loose patterns are a little bit trickier since they are not directly based on your body parts. These kinds of patterns are used for armor parts that look bigger, more massive and just 'hover' over your skin. Results of armor with loose patterns are bulky breast plates, wide bracers or simple shoulder pieces.

Note:

Creating patterns usually is a pretty fast process, but it's also easy to loose overview at the same time. To avoid pattern chaos it's always a good idea to mark every single piece and to create a sketch of the costume and all its parts before starting the building process.

Even if you are not able to copy the area of the required body part directly, it's still possible to transfer the wrapping technique to create loose patterns. All you need to do is expand or stuff the shape of your body with foam, cotton, bubble foil or some other filling material and repeat the technique for direct patterns. ■

Check out my pattern tutorial on Youtube.
(you can activate English subtitles in the Youtube player menu)

http://youtu.be/M_r2lKnovyI

Free patterns

To create patterns completely without any reference or mold is really not that easy and needs patience. These kind of patterns are free so they don't stay in any connection to your body shape - like pauldrons or shields for example. The only help you have for these work steps are your original costume reference, your imagination and a measuring tape, which gives you kind of a basic outline for the pattern's size and form. Free patterns are a lot of trial and error. Just go for it!

Note:

Since you can transfer these methods to any armor part, you won't find a specific step by step guide for special pieces like helmets or shin armor. However now you know what you need to do: Just wrap any part of your body, cover it with tape and draw some lines on it.

And no matter if you are male or female, large or small, it always works!

Note:

Creating patterns for armor is something completely different than creating patterns for cloth.

It's usually not enough to just have the measurements of a body, but you need its full size, volume and shape. Especially when it comes to shaping your armor pieces you will notice that you want to sculpture and mold as much as possible on your own skin.

Note:

When it comes to planning your costume, always keep in mind that you will construct it for yourself and not for a wild orc, a bulky barbarian or a tall nightelf. No matter which goal you have and which reference you've chosen for your upcoming costume, you will always stay a human with human proportions. So build the costume for your own proportions instead of trying to bring overproportionate pauldrons or helmets to life.

Now it’s time for the real deal. At this moment your patterns should be ready, clean and symmetrical, your heatgun plugged in and your scissors sharp and hungry for some Worbla-cookie-dough! And after endless time of searching for internet knowledge, watching tutorials, planning and waiting for the material delivery man you can finally start with the real work.

But be prepared: Creating an armor costume is always a challenge and won’t be easy. However! No matter how hard it will be at times - don’t give up and keep on fighting!

The end result will be awesome and you will love it!

Bring your armor into shape

Once you heat Worbla or Wonderflex for the very first time, you'll notice that it's a bit difficult to bring it into a special shape and to keep that shape until it cools down again. In fact both materials are very flexibile, strechable, even breakable in their active form and it's pretty easy to loose control over them. A nice solution for this problem is to limit this flexibility by adding a core of craft foam!

You'll also find an example of this method in one of my very first video tutorials (you can activate English subtitles in the Youtube player menu)

http://youtu.be/YElXK-_uIAg

Also check out my new Worbla breastplate tutorial (same here for English subtitles)

http://youtu.be/hXme58f4Ibc

As you can see I transfer my completed patterns directly to craft foam, cut it out and cover it from both sides with a slightly bigger piece of Wonderflex or Worbla. Make sure to cut the borders not too close to the core inside or too far away. When done, press all three layers together.

There are now several ways to shape armor pieces.

Parts, which are based on direct patterns, can be directly molded on your own body. Since the material works with heat however, be careful to avoid burning yourself. To prevent burning it helps to cover your skin with cold water or cool the material directly after attaching and forming by holding your arm or leg under a cold shower. Cold water also helps a lot to fasten the construction process and shortens the waiting times until the material cools down. ■

Note:

A common problem of the sandwich method are the air bubbles, that appear once you've heated the material up too much. Most of these bubbles can be avoided by slow and well spread heating. Get rid of annoying bubbles by making tiny holes with a fine pin and releasing the remaining air by gently pressing with your fingers.

Note:

If one or all of these materials are new to you, start with something small like a bracer. This way you'll get a feeling for the behavior reaction of the material and can experiment with it without wasting too much time or money if you fail.

Aside from the sandwich method it is also possible to work only with a double layer of the raw material. This piece will have much more flexibility, is stretchable and works good with big curves, but it can also be very tricky to control it. The result however is also as durable and solid as a sandwich layer.

One of the main problems of bigger parts are often their complexity. After transferring patterns and covering all craft foam parts with Worbla or Wonderflex you may have a complicated puzzle in front of you as a result. To keep the overview it's helpful to use labels, numbers or a sketch for the construction. You can just draw on your parts since it will be painted over afterwards. Also keep all pieces always in one place so nothing gets lost and always have in mind what part needs to be done next.

Another problem of armor making is clearly the challenge of creating equal duplicates. In contrast to sculpted armor you are not able to just cast and copy a piece several times to get a completely identical result. If you work with Worbla and Wonderflex you have to create each armor part from the ground up again and again and especially if you do a long break between two similar pieces you'll notice the problem. ■

There are some suggestions I can give you to prevent this:

- Never throw away your patterns before finishing your project. It's not rare that something doesn't quite work out as it was supposed to. Patterns are the base of your armor costume and to recreate patterns takes time and it's almost impossible to achieve the exact same shape as the original for a second time.

- Transfer working steps directly to all further required similar armor parts. If you need a bracer twice, then cut the foam core twice. Also build and shape it at the same time and do the same with your detailing work.

- Avoid long breaks during your project and especially between several similar parts. Every project will have a special style and design, which you will always have in mind if you are in your working mood. Taking a break during this process can make it hard to get back into the right mindset again and it's possible that parts of the same costume will look differently in the end.

Detail work

When it comes to detail work, your projects require patience, creativity and also some imagination of your own. References are often blurry, unclear or just don't show any details in general and to keep this look would often give an armor a boring, unfinished look. It also comes down to the question if you'd like to work accurately to your original artwork, 3D model or description or if you'd like to give your costume a more personal touch.

I personally prefer the second option just because in the end, most of the time nobody has your reference in mind and I like to create my costumes for my own satisfaction, not for the judgment of somebody else. It's also entirely possible that your reference has so many details already that you don't even know where to start. Try to make a helpful drawing for your own orientation in both cases.

One of the easiest ways for detailing is to draw the final look directly onto the armor. For creating a more deep and sophisticated look you can also add further material layers on the armor. In this case it's suggested to cover the armor piece with an additional layer of painter's tape and to draw the details directly on the tape.

After that you are able to remove the tape and – if you are careful enough – cut out some perfect patterns for the upcoming detail layers.

Always consider which parts you want to highlight and which structures you want to create. Detail work requires some experience and an eye for what looks right - it's always better to try your design first on a smaller armor piece before you start with a huge breastplate or complicated pauldron.

In general there are a million possible ways to add details. One way and my most used one is just to work with simple lines. For that method just cut out a huge square of Worbla, fold it in the middle and connect it well with enough heat and pressure. At the end I just cut straight stripes with a width of 5mm to 15mm (0.2"-0.6") and let them cool down. I usually use a sheet around 50cm x 100cm (20"x40") of Worbla and cut stripes not only for the current project but also for future projects since I use this method a lot.

1. Thin Worbla stripes
2. Friendly Plastic / Worbla's Deco Arts
3. Reshaped leftover Worbla

Carefully reheat the armor and the stripes to create border lines, complicated and filigree ornaments, as well as patterns and whole artworks. The difference between a piece without details and one with them will be enormous.

Another way is to directly sculpt details. A double-layer of Worbla or some leftovers can be used for that purpose. It's really simple! You just reheat the leftovers, press them together into one single ball of material and just shape it into a desired form. Since the material cools down pretty quickly, it may be necessary to use the hot air gun several times again, but this method allows to save money for sculpting clay and minimize the amount of material thrown away at the end. ■

Note:

Even though the shape of this bracer is very simple, adding details transforms it into a very special piece. In the end, the difficulty of the construction hasn't really changed, but since details are not only drawn on but fully sculpted, the bracer looks much more interesting and also more real.

Alternatively you can also use Friendly Plastic or it's German equivalent Worbla's Deco Art for three dimensional shapes. Since this material turns into a very sticky clay once it reaches around 80°C (~176°F), it connects very easily with Worbla and Wonderflex and also sticks to many other materials. To prevent your fingers from burning, dip them into cold water and then just sculpt any shape you wish.

Note:

Working with Friendly Plastic can be a bit tricky, since it sticks a lot once it's hot enough. A good way to bring it into shape is to heat it up in hot water and take it out when it gets transparent. That's the indication for the right temperature. Dip your fingers into cold water to avoid burning yourself and just try to sculpt with it. It behaves a lot like clay, or more like evil, sticky clay that wants to burn you when you give it the chance!

Note:

Depending on the depth you want from your details it's necessary to choose between a double layer of Worbla or a sandwich with a craft foam core. I usually try to create pretty thick armor around the center and then get thinner by the outer areas. If your armor however is already solid enough, it's a question about taste or more like a special style everyone has to find for himself.

Note:

When it comes to details it may be hard to have a good reference for the building process. In this case just follow your own imagination, which was also the same I did for this pair of shin armor. Nobody will blame you at an event for not following the reference until the last brush stroke or pixel. And even if: Keep in mind that you do the costume for yourself and not for somebody else and you should be the only one who needs to like your costume.

Puh, so much for the process! Now let me show you some work examples from the last couple of years. All pieces are up to the point where they are ready to be painted - which I will cover in detail in an upcoming book.

So, here we go!

Crafting example: Soridormi Pauldrons

Soridormi is a very good example for creating a piece with free patterns. Its whole shape and size is based on a simple curved triangle I drew completely free on a piece of paper. This piece was then duplicated and connected at the top to get a 'roof' kind of shape. This piece then was duplicated two more times but smaller each time. As you can see, the pauldron in total consists of only three separate pieces, which were just copies of the original 'roof' shape.

It always takes a bit of time to create a pattern and it's pretty rare that the first attempt is already the one you can use for your armor. The most important point for this work step is patience and the will for experiments. While I worked one these, I drew several shapes in several sizes on a thick piece of paper, cut them out, fixed them together with some tape, tested them on my dress form or my body and edited them then again and again. In total, one pauldron took about 1/3 XL sheet of Worbla.

Getting the patterns is already hard. Getting these piece into shape however turned out to be quite the hassle as well since I had no actual mold it was based on. However it can be very helpful just to an keep eye open for helpful things in your household. After I shaped most of the parts by hand, I found out I could just let them hang over a plastic bottle for their final cooldown. Bottles, pillows, furniture and any other daily household stuff often have useful angles or shapes which can be used for shaping your armor pieces. Just keep an eye out for anything useful. Dressforms are great supporters as well and can save you much time and nerves. ■

Note:

Since the form of the pauldron doesn't allow a direct connection to the shoulder, it has and additional mini-pauldron inside, which is a direct mold of my shoulder and allows for a tight attachment and perfect fitting.

Photographer - Benjamin Schwarz

Crafting example: Female Breastplate

While working with Wonderflex for a pretty long time, female breastplates were a huge problem for me since this material seemed to have problems with curves and such. Worbla however allows you to solve this problem since it's so stretchable. With it you are able to create perfect cups for the base of the armor piece. Just span it over a sphere! For a detailed step by step instruction please check out my Youtube video again:

http://youtu.be/hXme58f4Ibc

It won't be easy to create the perfect shape for your bra size and it's often necessary to add additional padding for a good final look of your cleavage. I personally prefer high quality push-up bras like the Victoria's Secret Bombshell bra. For some costumes I even wear two bras and additional silicone paddings to stop my cleavage from disappearing behind the breastplate. A well padded breastplate should look like in the following image. It's boob-magic! Only for women though :)

By following this link you'll also find a very good padding tutorial:
http://www.deviantart.com/art/Cosplay-Cleavage-Tutorial-363874640

Note:

In contrast to female breastplates, male versions are very easy to create, which is the reason why you won't find a finished example in this book. All you need to do is to create a pattern (page 13) and mold it directly on your body or a dress form until it has the shape you want.

If you plan a front and a back plate, then build two separate pieces and connect them with buckles (more in the 'attachment' part of this book).

Photographer - Jakob Schwarz / Janina Quakenack

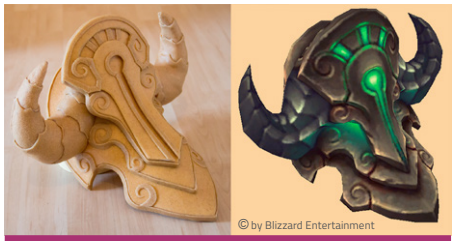
Crafting example: Deathknight Tier 16 Pauldron

The pauldrons of the Deathknight costume are also a very good example for free patterns. Like I already did for Soridormi I just experimented a lot until I found the final shape of the base. It's just trial and error really. Here however it was very important to find a size that not only is as similar as possible to my reference, but also allows the final result to fit well into my suitcase.

So when it came to the test my patterns, it was not only important to evaluate the base shape - it was also necessary to already have the final shape and size of the finished pauldron in mind.

You can also see in the first picture that I've tried to work with much thicker parts since the reference seems to consist of several very huge and bulky plates. To solve this problem I used 3 layers of 2mm (0.08") craft foam and also added a further sandwich layer for the details. To achieve the three dimensional look of the horns I carved pink insulation foam, which is a great way to get bulky shapes (more on that in my upcoming book on prop making). Later the foam was directly covered with some double layer pieces of Worbla.

As you can see I used my Worbla stripes technique for the detailing work and it makes a huge difference. Despite of that the result is not perfect since Worbla is not really the right material for a job like that. It would clearly be better to sculpt such a piece out of clay, cast and mold it, but this would require much more time, effort and money for the necessary materials. Here you can see how wide the range for the use of Worbla really is. You don't need to stay at simple, flat armor, you can build huge and bulky props by using different kinds of foam or just adding more layers. In total, one pauldron took about 1/2 XL sheet of Worbla.



Note:

Since the shape of the pauldron doesn't allow a direct connection to my shoulder, I integrated a mini-pauldron inside, just like I did with the Soridormi pauldron.

Model - Jennifer Lynne
Photographer - Benjamin Schwarz

Crafting example: Warrior Tier 5 Pauldron

Since I really love the huge, bulky designs of Blizzard games pauldrons are a repeating element and because of their difficulty a good example. And despite of them mostly looking weird and complicated, it can be done with the right technique. At first you need a solid base. In this case I used a 20cm (~7.9") styrofoam ball and cut it into the right shape with a sharp knife. This piece was then layered with painter's tape. On the tape layer I drew the pattern, which was then used to create the Worbla sandwich piece. As always it cost a bit of experimenting to get the patterns right for the base and also the following blades, but as you can see it's a very simple method to build such a piece. In total one pauldron took about 1/4 of a XL sheet of Worbla.

Note:

Again, I used a mini-pauldron inside the main body so it would fit perfectly to my shoulder without shifting back and forth all the time. You know - it's bigger from the inside!

Note:

Styrofoam balls should be available online or in every big hobbystore in different sizes. If you prefer bigger pauldrons, just choose the ones with a bigger diameter. However be careful when working with heat: It melts the styrofoam and can destroy the base of your pauldron.

Photographer - Ramona Stanek

Crafting example: Wonder Woman shin armor

Wonder Woman's shin armor is a very good example for direct patterns. To get a perfect fitting base for this part I just wrapped my leg with kitchen foil and painter's tape, transferred the drawn result on craft foam as well as Worbla and shaped the final armor on my leg. Additional details like the wings on the top were drawn freely on newspaper and were tested several times before I added them to the final design. To reinforce the durability of the armor I created a second sandwich layer as well as a third and final detail layer on top which I filled with double-layer Worbla stripes and pieces. In total, one shin armor took about 1/3 of a XL sheet of Worbla.

Note:

It's not necessary to construct shin armor out of two parts like you can see it in the first image. I just prefer it, since most of the time I use material leftovers and these pieces are not large enough for a full armor part.

Photographer and Digital Retouching by Darshelle Stevens

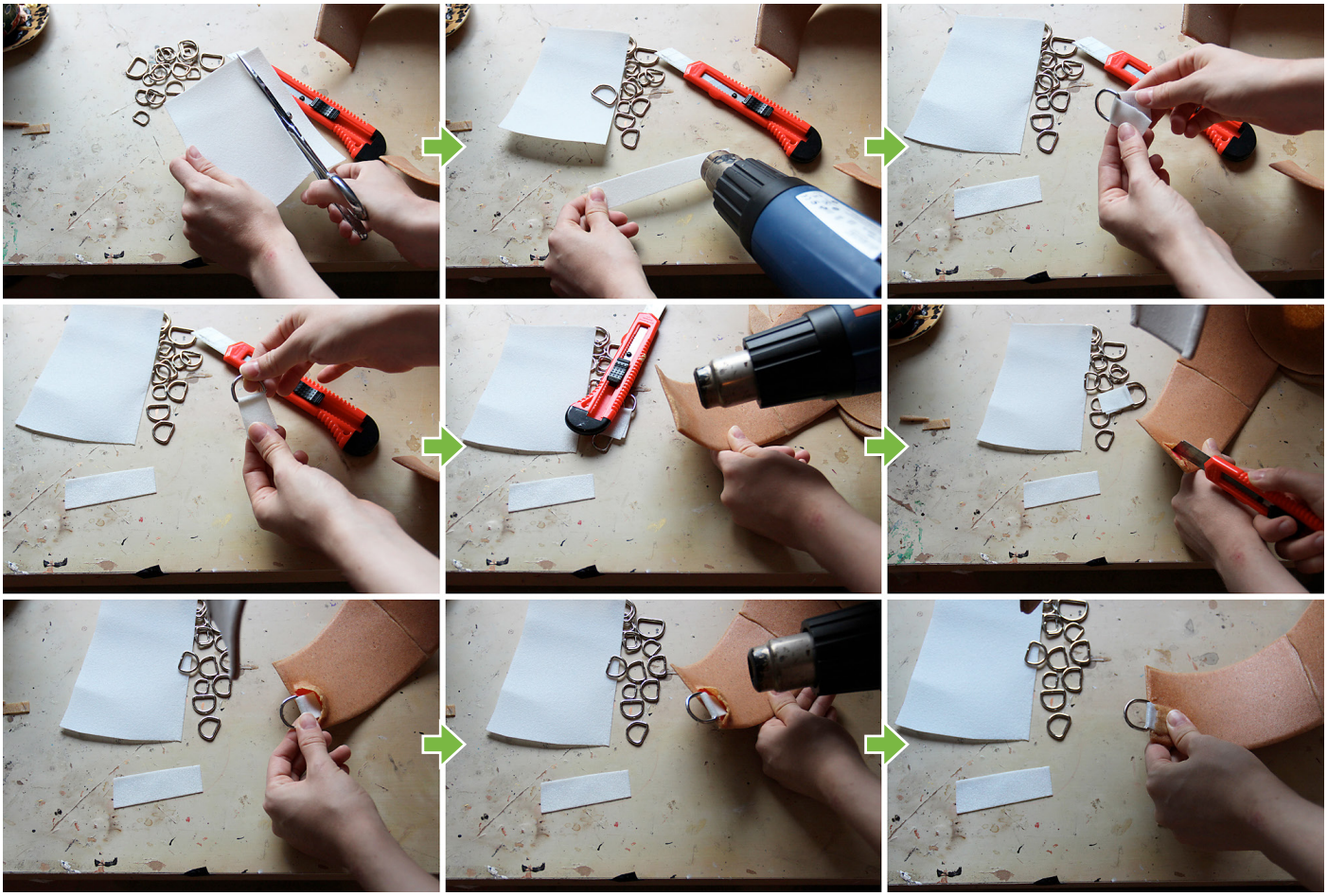
Well done! But you are not finished just yet. Have you even thought about how all this awesome armor you just built will even stick to your body?

Attaching your armor also decides if wearing it will be comfortable or hurt like crazy.

Attaching your armor

Despite of attachments being the 'invisible' part of armor, it's one of the most important. A well constructed attachment guarantees not only that your armor stays at the right place during every of your movements, it will be also be in charge of making the costume as comfortable as possible. While the parts themselves are durable, hard and don't really move in general, your attachment will be tortured and tested the whole convention day and when it fails you will be the first to notice that. Luckily there are ways to avoid these problems.

Let me introduce my own attachment method:

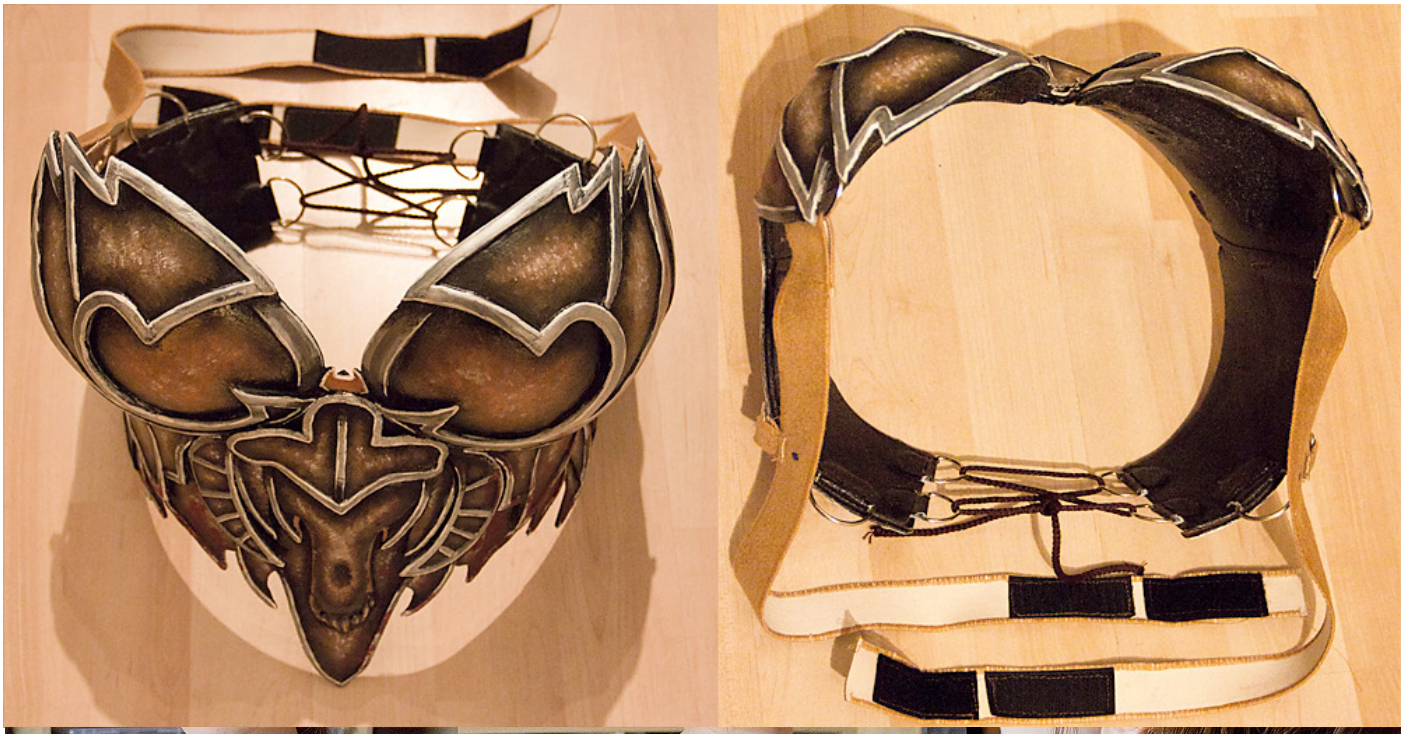


Foundation of this method are D rings, which are available pretty cheaply in any size. Since I had a bad experience with just gluing my attachments on, I now connect them directly with the armor itself by covering the rings with Wonderflex. It's also possible to use Worbla, but due to the grit inside Wonderflex has much more strength and durability when it matters.

After I've cut the whole piece into the right length, I heat up a spot on the back of my armor, open it with a small cut and connect armor and ring with pressure and heat. Since the ring is now a direct part of the armor, it's impossible to separate it without destroying the whole piece. This way I'm now able to attach belts, bands, strings and ribbons safe and reliable.

Placing the rings takes a bit of experimentation. Attaching the breastplates for example can require a lot or only a few rings. The main attachment however works with rings at the top of the bra cups and at the back, connected diagonally over my shoulders. Two more rings on top of the shoulder belts are then the base for attaching the pauldrons. ■

Since the shoulder armor of my Barbarian was pretty small compared to other projects a simple D ring on every belt was already enough.



For holding bigger pauldrons it's suggested to adjust these rings against the opposite belt under the neck on the back. Add another string to a ring in front of the breastplate to connect it to the front of the armor.

Note:

Armor in Hollywood movies is often attached with velcro tape or magnets directly to a bodysuit out of a thick quality material. If you choose this method, make sure not just to glue these materials on your armor, but connect them with your armor by letting the end of the velcro tape disappear under a piece of Worbla for example.

Note:

If you are not able to use visible strings, just use invisible ones. Transparent bra holders, skin toned rubber belts or silicone bands are the perfect solution for every kind of attachments.

To get more ideas for attachments please check out my attachment tutorial on youtube:
http://youtu.be/kujts-8rnPo

When it comes to pauldrons you'll notice that it can be kind of difficult to let them stay at the right place. A good solution for this problem are small mini-pauldrons which I've already mentioned in some of the crafting examples. Usually they are directly attached to the original pauldron or let it 'hover' a little by a small column between both pieces.

Parts, that don't allow a tight attachment to a breastplate like that of Soridormi require a solid connection to the body. As you can see, I've worked a lot with strings that go over my back and also under my arms. This attachment however was a pretty rough and spontaneous. Like every other, this one can still be improved.

For rough costumes like the Warrior or the Barbarian I also prefer to add fabric rags or fur parts, which not only hide the attachments but also gave my arms and legs more volume and more of a wild look.

Photographer - Benjamin Schwarz

Attachments should always be tested thoroughly before you actually wear the final version at a convention. My very first and still biggest armor got very sloppy attachments of only 3 hours of work for the entire armor. The result at the convention was, that the costume did fall apart. So take your time, test every part and every movement and check how comfortable, flexible and durable your solution is before you go out torturing yourself.

Since many of my characters require similar shoes, I have only a few different pairs which are comfortable, fit the costume and are a great base for some additional shoe armor. For that case however it's important to adjust the attachments in a way, that can be easily detached again without destroying anything. D rings are the perfect solution! In the following picture you'll see exactly how the attachment works.

Basically there are a few D rings that attach the belts and rubber bands around the shoe. If this is not possible due to the shape of the shoe (wedges for example), you can also use laces, holes or anything else that can work to connect the armor with the shoe. The final result can then be decorated with fur, fabric rags, shoe covers, etc.

Note:

When it comes to testing, especially the shoes are a part that require time. Since the movement of your foot is very complex and will be used a lot by just walking around, it's important that armor for this bodypart is very comfortable and wearable for several hours. If your reference doesn't allow a construction like that, think about adjusting it for the construction. Always keep in mind that the likeliest reason for changing back to normal clothes are hurting feet.

Transportation

I thought about making this the first chapter of my book, because it really deserves to come first. Thinking about transporting your costume should come as early as choosing which costume you want to make. If you want to create a small costume, it's for the most part okay to just squish everything into a huge suitcase and be happy with that. If you have something bigger in your mind however, transportation can be a problem which may force you to leave your costume at home.

I'm a lucky girl who gets to travel a lot. However I'm pretty unlucky that I most likely have to travel not only with really huge armor and props, but even more than one many of them. During my travel to Blizzcon in October/November 2013 I had 4 of my biggest costumes - the Protoss Wizard, the Deathknight, the Wizard, Wonder Woman and two large staffs with me. Add clothes for me and my husband for warm and cold weather for three weeks. We had two suitcases. So the only solution to make this possible was to plan everything right from the beginning. I really had to design and create all these costumes and props just for that.

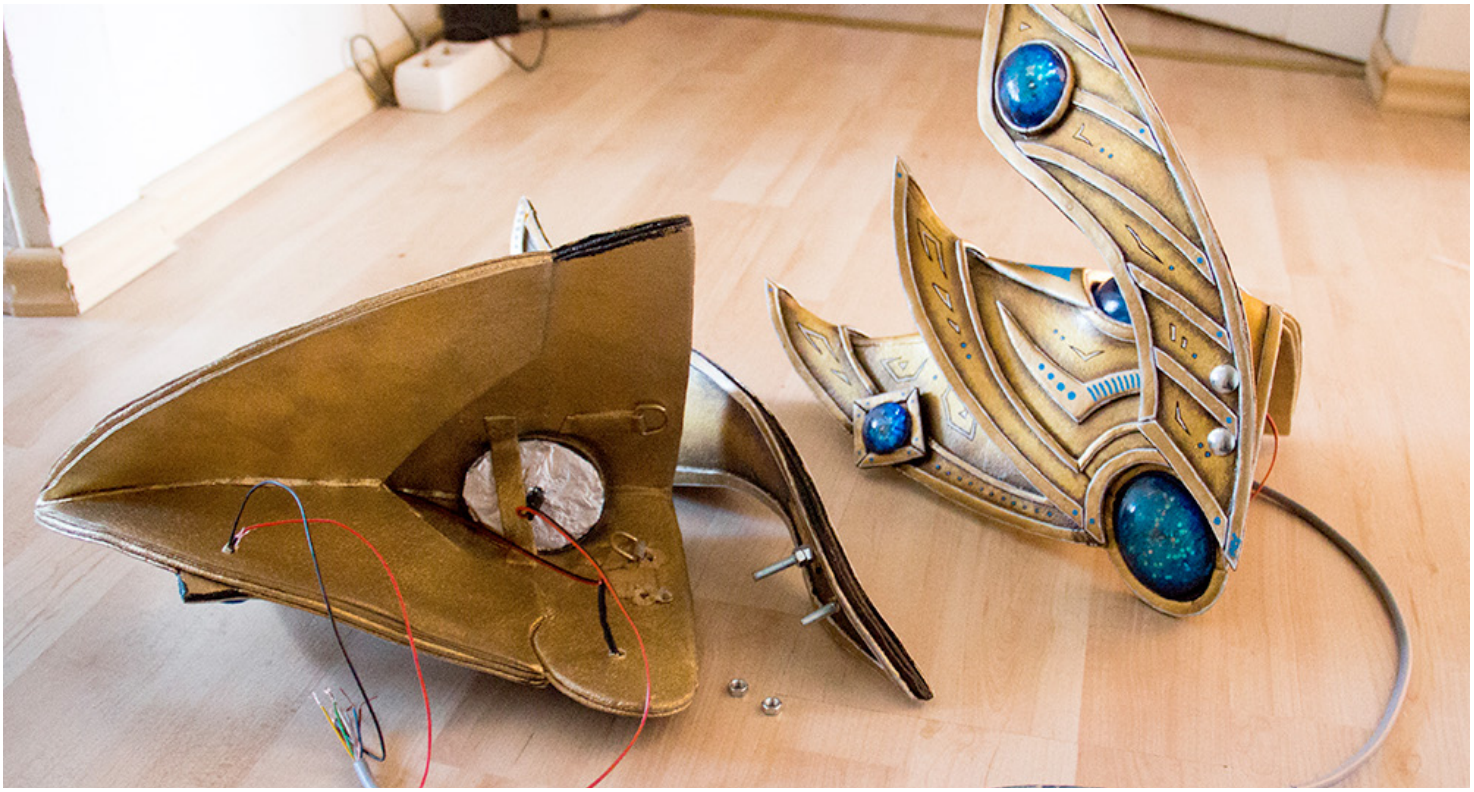
Note:

When it comes to traveling with 'fabric costumes' there is usally no need for a special suitcase. However, if you plan to bring big armor or hard costume parts with you they might get harmed during the transportation. It's a good idea to buy a big, solid hard-shell suitcase that protects your work and lets you sleep without worries during your next flight.

Try to get a feeling of what's possible and what's not. It should be pretty clear that a Transformers Bumblebee won't fit a 82cm (~32") suitcase, especially not in combination with Optimus Prime – or at least not in a version which is not a cardboard you can just fold. So, choose your costumes and props wisely and keep your possible dimensions in mind.

Another important point is also the way you construct your costume. A big shield will definitely have problems to fit inside. A shield however, that consists of four parts that can be stacked together would work even if it will still cost you a lot of your available space. So the rule is, not only to chose small parts for building, but also to separate bigger parts into smaller ones.

Separating can be very tricky and it's anything but easy to find a good way not only to construct something in similar pieces, but also to build it together at the end. Screws, magnets, clamps and everything else you'll find in a home depot for example can be a potential solution for your problem. Despite of that, there is sadly no tutorial in general for building a costume for a suitcase since every project is completely unique.



If you travel with a costume in your suitcase, generally you should have no problems because in security scan it only shows different plastics, paper maché, fabric and maybe some wood and electronic. As long as your costume doesn't have large metal pieces that look like bombs or weapons, your suitcase should arrive without being opened at the airport. However you can ask the staff before you check-in if the content of your suitcase is fine. I've been flying with my armor for years now and luckily never had any problems.

If you manage to fill your suitcase - maybe after hours of experiments with different arrangements and stackings (which I call cosplay-tetris), you've reached the point of padding. Use cotton, clothes, bubble wrap and anything else you can find and squish it between your costume pieces.

The best result is if you are not able to move anything inside your suitcase at the end. In general Worbla and Wonderflex are solid and durable enough that even big damages are not that bad since everything can be fixed pretty fast with a hot air gun.

So, never ever forget this helpful and rescuing tool when you travel!

Check out my transportation tutorial on Youtube.
(you can activate English subtitles in the Youtube player menu)

http://youtu.be/jyqLCJCIAnI

Thank you!
Here we are now! I really hope these pages were a help and inspiration to you. I hope I answered at least a few of your questions and you already have an amazing armor project in your mind. I also know that this hobby won't come cheap, but I guarantee you, you won't regret any cent or second you spent for it. Planning, preparing and sculpting such a piece of art is something you'll fall in love with.

Yes, you will fail sometimes, you will have problems and you will get stuck, but I'm sure you'll find a solution if you think about it enough. And like I've grown since my very first armor many years ago, you will also grow and at the end you will rock every convention. So be brave, be busy, be excited and let your dreams come true, because cosplay is something that connects creative people from all over the world. And at the end there is nothing better than sharing what you enjoy!

TO BE CONTINUED...

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