# 2019 BA / OCTO NINA CHERRUG



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## **ABSTRACT**

Today's sports glasses are great for rather extreme sports like biking, skiing and running often in tough weather conditions. They protect against wind, rain, blinding sun in the snow but also insects and dirt. But what about those people who perform casual sports such as gym, jogging, and yoga?

I made a survey to find out the main reasons why people don't use their own glasses while performing casual sports, what I found out was that people are afraid of breaking and/or losing them, they don't have a great fit and they aren't comfortable. I saw a problem to be solved here, and it led to my brief - design comfortable and protective eyewear that provides perfect vision during casual sports. The solution would be to combine the functionality of today's sports glasses with the design language used in high fashion brands such as Balenciaga, Percy Lau, and Acne Studios. The curved frame and the straight temples which are one of the key features in sports glasses provide an optimized fit for different face shapes, and this I wanted to implement in my design. The sustainable thinking was a great deal in the design process, which led to the elimination of screws and hinges and resulted in a pair of glasses in only one piece where the frame and the temples are connected with a living hinge. The process included a lot of sketching, laser cutting, 3D-printing, interviews, company visits and resulted in a lightweight, flexible, nylon printed frame.

With this new kind of eyewear, my target group can enjoy working out with a great vision, protection, and style.

# BACKGROUND MOTIVATION

The sports glasses that are available on the market today does not resemble the trends used in common eyewear brands people use every day. Extreme sports glasses are focused on one specific target group who performs extreme sports. It needs to be accessible eyewear for the people who perform casual sports too, without the design language that resembles extreme sports. With a lot of inspiration and visual identities taken from high fashion brands and the best functionalities taken from the sports eyewear market such as Bliz, Oakley, and Prestige - an ultimate eyewear frame can be designed for the market today, for the people who perform casual sports.



Why people don't use their own glasses in the gym:

Fear of losing and/or breaking them

The sweat makes them move around

The glass gets foggy

They don't stay close to the head

They are not comfortable

#### AIM

Design a pair of glasses that will align with the style of todays eyewear trends and at the same time provide perfect vision and a great fit on to the head.

#### **TARGET GROUP**

People who needs visual aid who are performing casual sports.

# **BRIEF**

DESIGN COMFORTABLE AND PROTECTIVE EYEWEAR THAT PROVIDES PERFECT VISION DURING CASUAL SPORTS

# **DESIGN STRATEGY**

My design strategy will, first of all, contain a survey and discussions with people to get an overall look over the problem I want to fix — why people who are in need of glasses don't use their own glasses during a workout. After confirming the problem, I could start looking into the market. Comparing different brands, find qualities and also details missing in the existing market today. I was also trying to find a visual identity for my glasses, by comparing different fashion brands with the eyewear market, budget to luxury. After the research, I had my function analysis and a clear picture of what I wanted to design. Sketching, visit an eyewear design team, laser cutting, 3D printing, CNC milling, and user testing was the main strategies used for this project to get the final prototype.



TARGET GROUP TARGET GROUP

I made up four different personas that would be the target group for this project.



## **MONICA 58**

Mother of 3 children, works at an IT company.

Goes out jogging 3 times a week and does Pilates at a gym once a week.



## SARA 20

Works at a café, saving money for a eurotrip.

Goes to the gym 4 times a week and plays basketball occasionally.



### **AMAT 28**

Full time economy student.

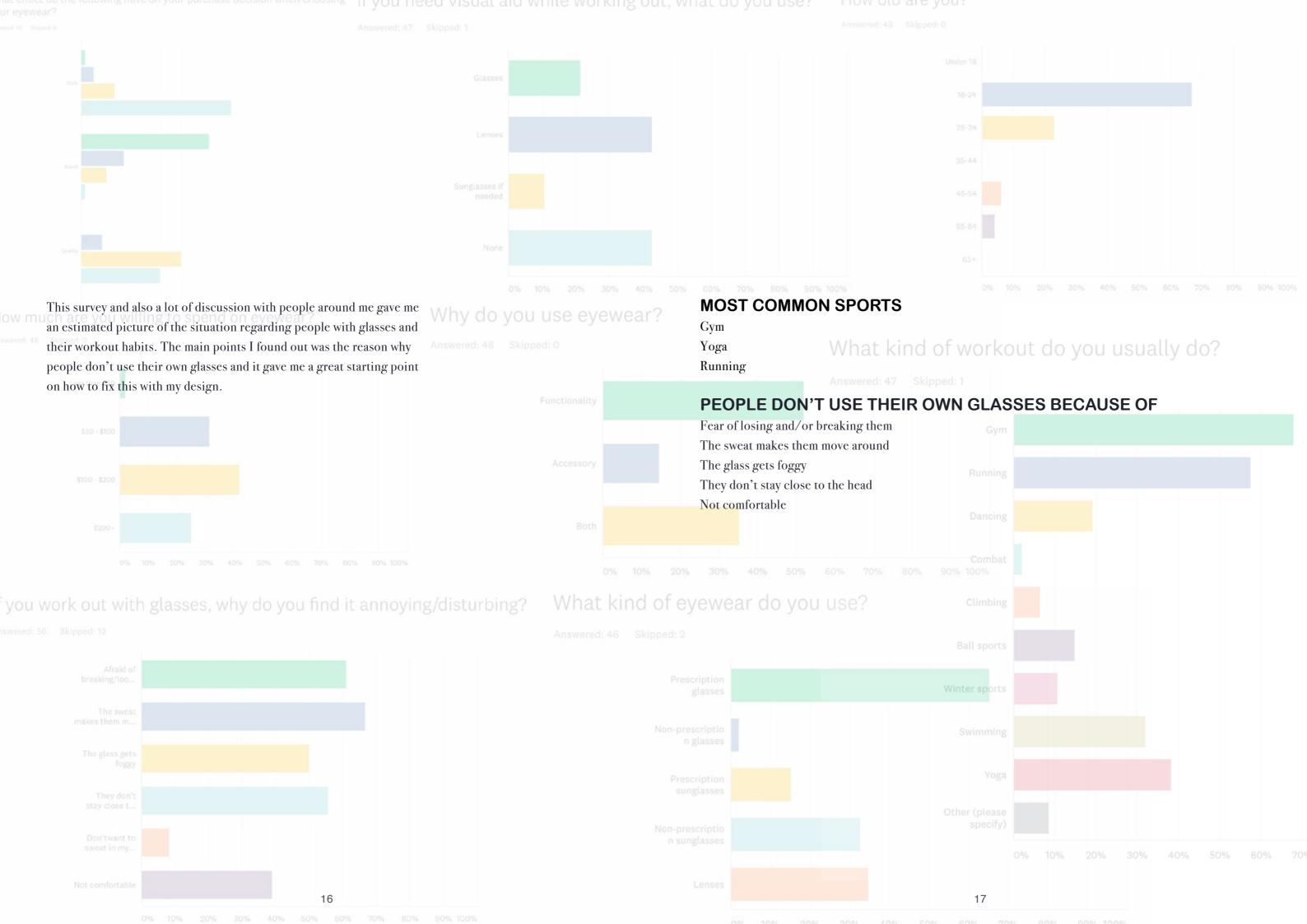
Goes to the gym 2 times a week. Lifts weights and uses the machines.



### DAVID 42

Father of 2 small kids. Works at Ericsson.

Goes sailing during the summer and loves to go hiking.



#### **SPORT EYEWEAR MARKET**

#### **FASHION EYEWEAR MARKET**

















SUNPOCKET

I looked into both the sports eyewear market and the fashion eyewear market. I also looked into the overall fashion market for some branding and design research.

I wanted to combine the great qualities in the sports brands but go further towards the design language within the fashion market.

To find the combination of the function in the sports market and the form in the fashion market, was my goal.

### **SPORT EYEWEAR MARKET**

#### **OAKLEY**

1 400 - 4 300 SEK







#### SUNPOCKET

1 850 - 1 950 SEK





#### **BLIZ**

300 - 1 500 SEK







#### **FAT PIPE**

250 - 400 SEK







149 - 300 SEK





## **SPORT EYEWEAR MARKET** WHAT DO THEY HAVE IN COMMON?



## **FASHION EYEWEAR MARKET**

**MOSCOT** 

3 000 - 4 200 SEK







**NIVIDAS** 

1 499 - 3 499 SEK







## **SMARTEYES**

1 000 - 6 000 SEK







MARKET RESEARCH MARKET RESEARCH

## FASHION EYEWEAR MARKET WHAT DO THEY HAVE IN COMMON?



BRANDING RESEARCH
BRANDING RESEARCH

I also wanted to look into other brands that is not usually connected with the eyewear industry. This to find different ways of expressing your brand and also to see where on the market I wanted to place my glasses.









MARKET ANALYSIS MARKET ANALYSIS



After all of my market and branding research, I could get an estimation of where I wanted to place my glasses. First of all, I want them to be placed in between the functional and the emotional design since I want to keep the emotional look but still keep the important functionality in mind. I also find them a bit higher up on the price scale since it will be a unique design for its purpose. People who need my product won't have a problem paying for it.

## CONTACTS

I got in contact with the product and design team at Smarteyes in Gothenburg. Smarteyes is an eyewear brand which wants to see their brand as a fashion accessory and not only a visual aid. They believe everyone should be able to afford well-designed glasses in high quality.

I got in contact with Sofie Tenggren and Lisa Hagenström, who works at the Product and Design Department in Gothenburg. I came to their office and together we talked about my project and also their design process. I got a lot of great impact and inspiration after this visit and believe it helped me a great deal to narrow all of my research down into one final design.

I also got in contact with Jan Jonsson, the founder of Future eyewear group. He answered some of my questions about sports glasses and what is important to think about.

SMARTEYES DESIGNTEAM VISIT



What is your approach to sport in eyewear trends today? We can see a lot of sport in today's eyewear frames! It is a lot of pilot frames and also colors like red and blue. It's overall a great sports trend today. People do workout more and with the great impact of social media, people are even more aware of what they are wearing during workout.

Are there any other trends that are extra popular today? We were at the Optician fare MIDO in Milan this year where we saw a lot of minimalism and small frames. Also a lot of geometric frames and tints in the glasses. It's also very trendy with sustainable design thinking when it comes to the

choice of materials.

What does your design process usually look like? First, we look at what people need today, then if it has been sold well before. Then we usually go straight ahead to sketching and mood boarding. Since our factories already have all of our standard measurements we send them our sketches and mood boards, and they give us some samples to choose between. After some adjustments, we send it back for the final production.

What do you find important in sports glasses? First of all, they need to be lightweight, so you feel them as little as possible on your face. They need to have a great

fit, the bent shape in the front is therefore rather important to follow the shape of the face for the best fit. Also, ventilation in the glasses is great, to prevent fogging. They are placed in different places depending on what kind of sports glasses it is. On the side for speed like cycling, and close to the nose for jogging and gym workout.

Any other advice for my project? 3D printing would be a great option since it gives a very lightweight frame, and you can be very precise with the design. But also follow your own beliefs in what you feel is trendy and looks good today.

#### **KEYWORDS FROM THIS VISIT**

SPORTY = TRENDY GEOMETRY 3D PRINTING LIGHTWEIGHT

FUTURE EYEWEAR GROUP FUTURE EYEWEAR GROUP



material we use frequently in our branch. Our goal is to find another material and replace all the plastics in packaging by 2021. We also work a lot of chemicals and are minimizing the silicon in our goggles. A lot of brands have silicon in the logo on the temples or straps just for the look of it, but we wanted to skip this.

How do you think the future will look when it comes to sport glasses? People are getting more active every day, and we are focusing on a lot of different kinds of sports and therefore we can see a great future for our segment.

What would you say is the most important qualities in a pair of sports glasses? Obviously, the material choice in the frames is very important. It needs, for example, be flexible even at low temperatures. To have a low weight is also important. High quality in the lenses is also an important part.

Is there a reason why most of your ends/bows are very straight? It is simply because they follow the heads shape best.

What makes your glasses fit so well during workout?

A) Adjustable nose pads which do not glide around on the nose. It is also adjustable

What would you say is the for the best fit and to fit most important qualities every nose.

B) Adjustable and rubber coated tips temples. This makes the glasses stay close to the head and you can also adjust the temples in any way you want, for the best fit.

Who is your main target group? All active people.

How do you bring sustainable thinking into the design process when it comes to materials? We work very hard with sustainability, chemicals, and the environment. We have a consultant who is an expert in this area who works for us. We have a great focus on plastics since that is the

#### **KEYWORDS FROM THIS INTERVIEW**

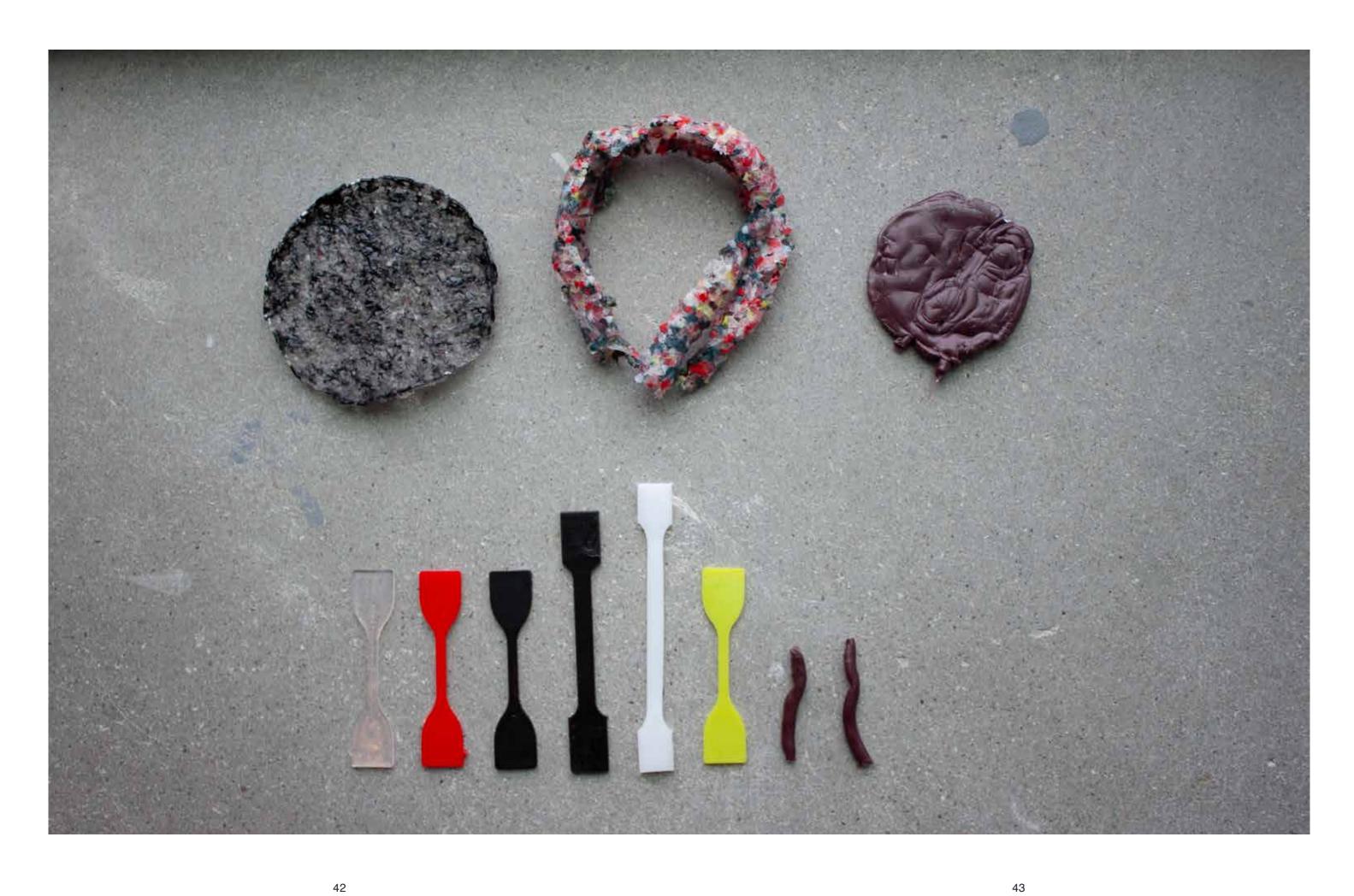
## ADJUSTABILITY SUSTAINABILITY

# SUSTAINABILITY

To have sustainable thinking is one of the most important parts of the design process. I was thinking about different materials I could work with to make my glasses as sustainable as possible. It is other stuff as well that comes into sustainable thinking. What is the lifetime of the product? Can it be disassembled for sorting when it gets thrown away? Does it need to consist of more than one material?

I have been experimenting with different recycled plastics but started further in my process to go further towards the sustainability of making my glasses in one piece, without screws or hinges.

SUSTAINABILITY SUSTAINABLITY



FUNCTION ANALYSIS FUNCTION ANALYSIS

## **FUNCTION ANALYSIS**

PROVIDE PERFECT VISION

BE COMFORTABLE

HAVE A TIGHT FIT

FASHION CONNECTION/
RESEMBLE YOUR EVERYDAY GLASSES

SUSTAINABLE DESIGN

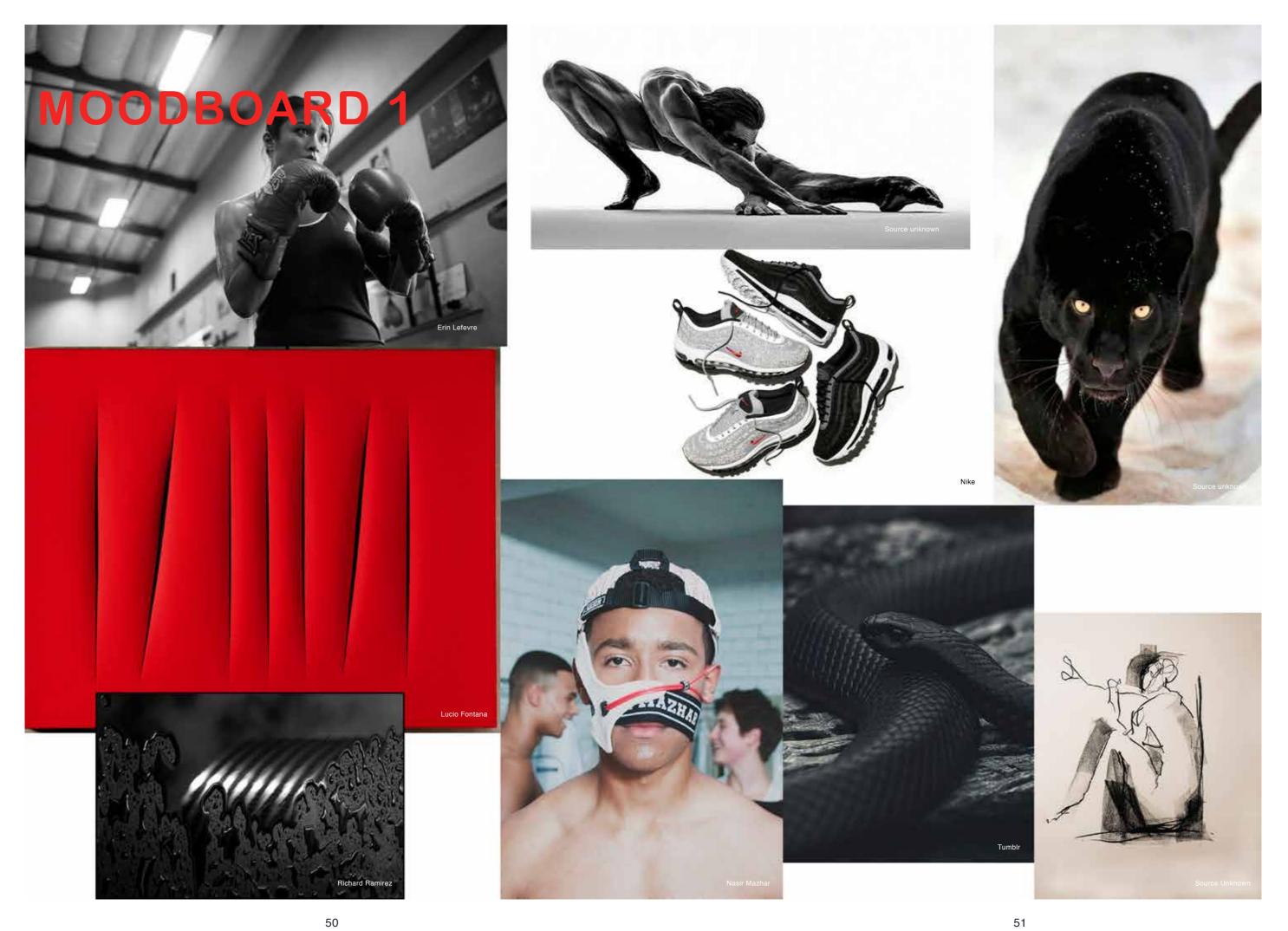
ATTRACT BOTH WOMAN AND MEN

# **PROCESS**

# **VISUAL IDENTITY**

MOODBOARDS AND SKETCHES

VISUAL IDENTITY VISUAL IDENTITY

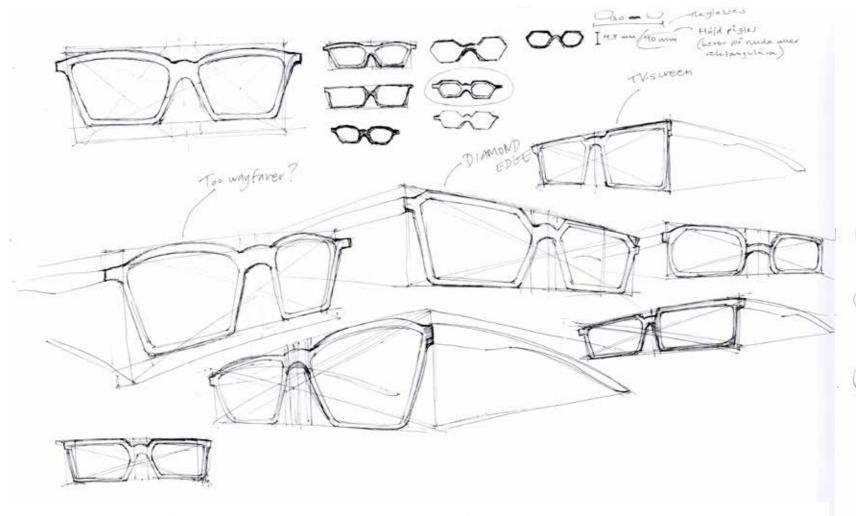


VISUAL IDENTITY

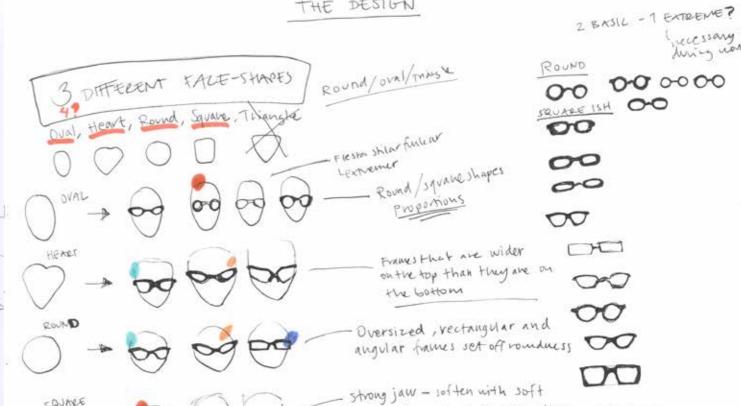


I started of with one moodboard to capture a feeling of what kind of design language I wanted to go with. At first I was looking a lot for sharp edges, streamlines in the human body and a panther, the color red, stripes, and sport. After this I did some sketching of different frames, I also looked into different face shapes and what frames would fit best with them.

Before I went in to prototyping I did some more sketching and moodboards.





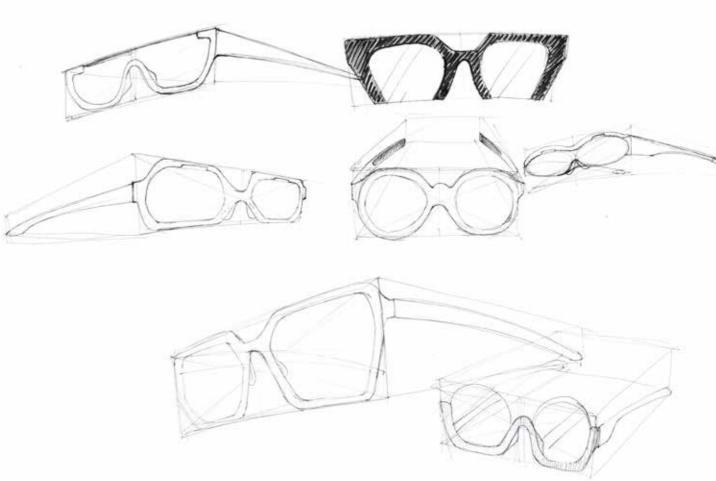


lines in frames or rimless edges

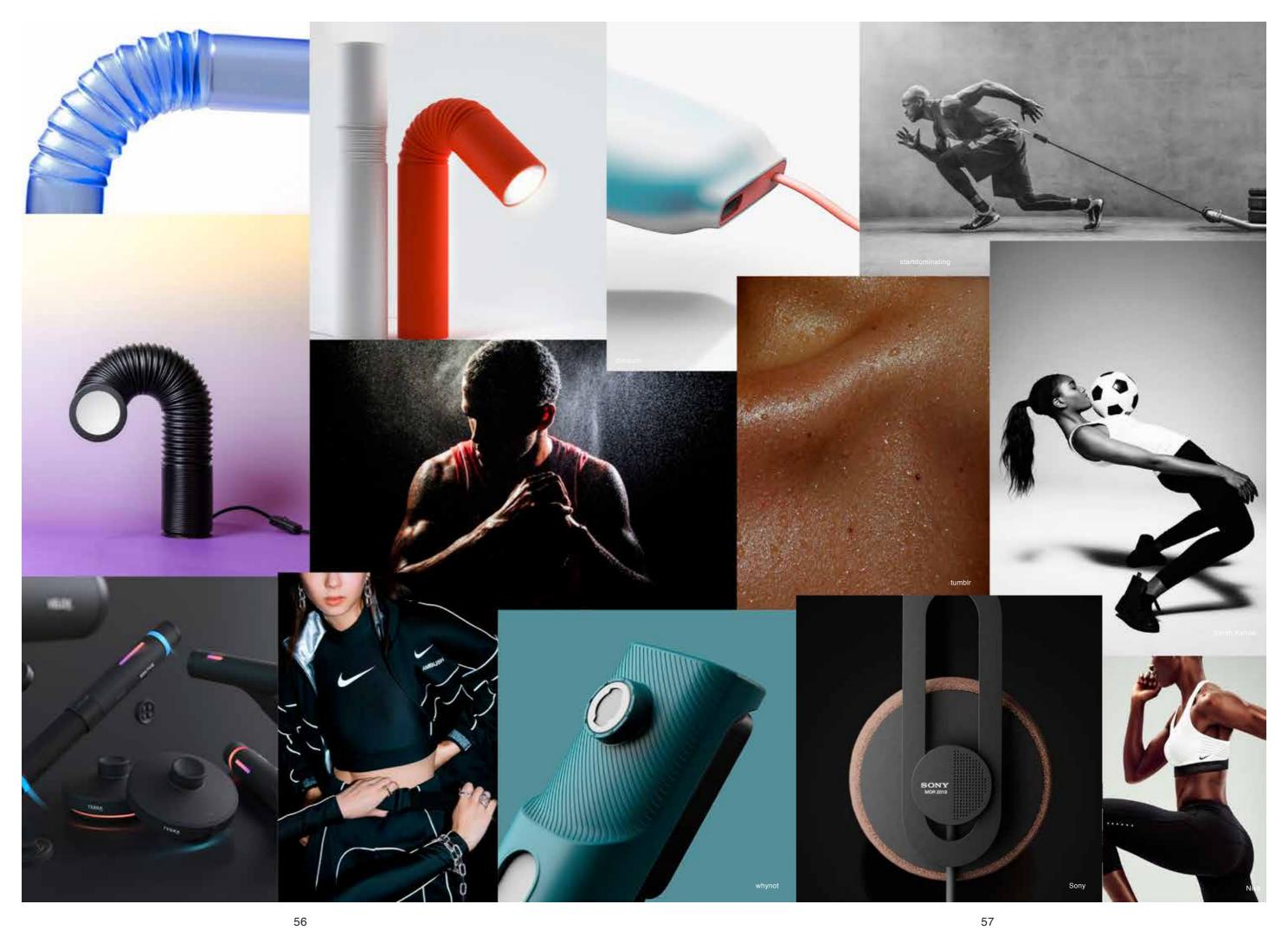
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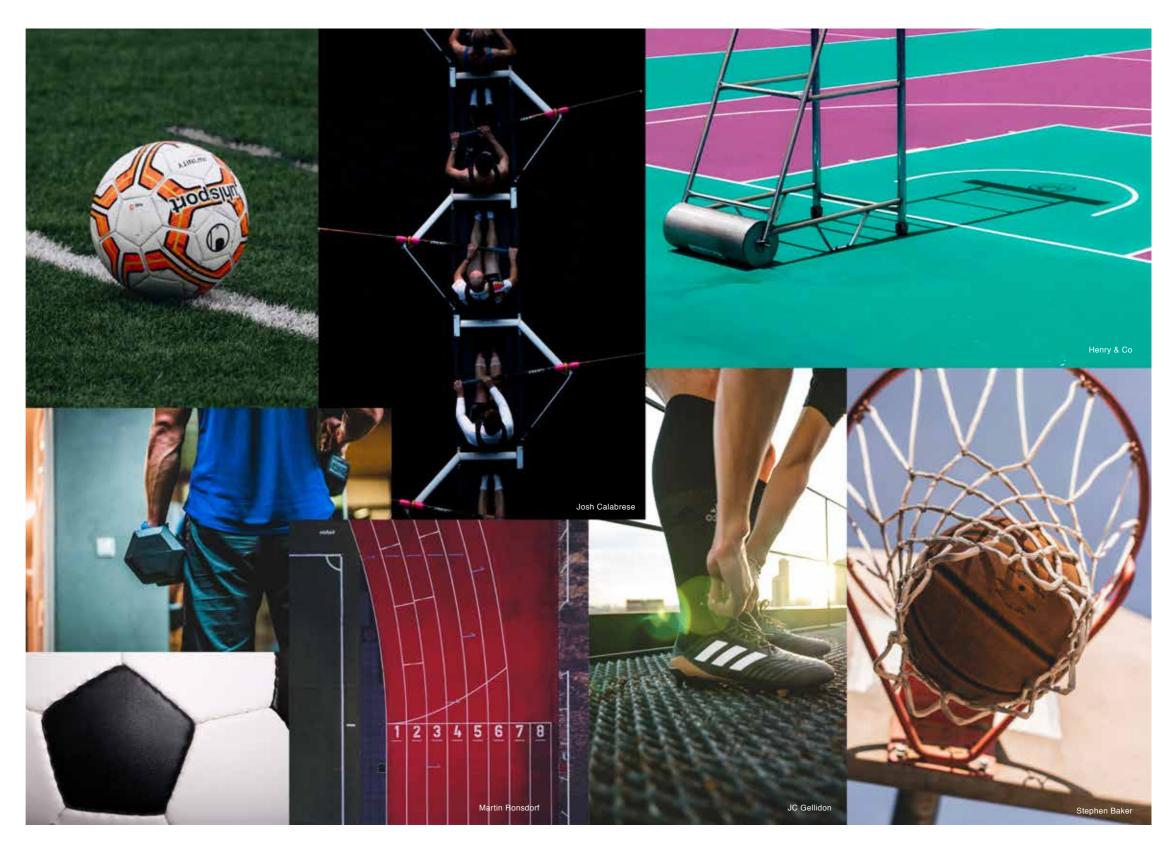
THE DESIGN



VISUAL IDENTITY VISUAL IDENTITY



VISUAL IDENTITY

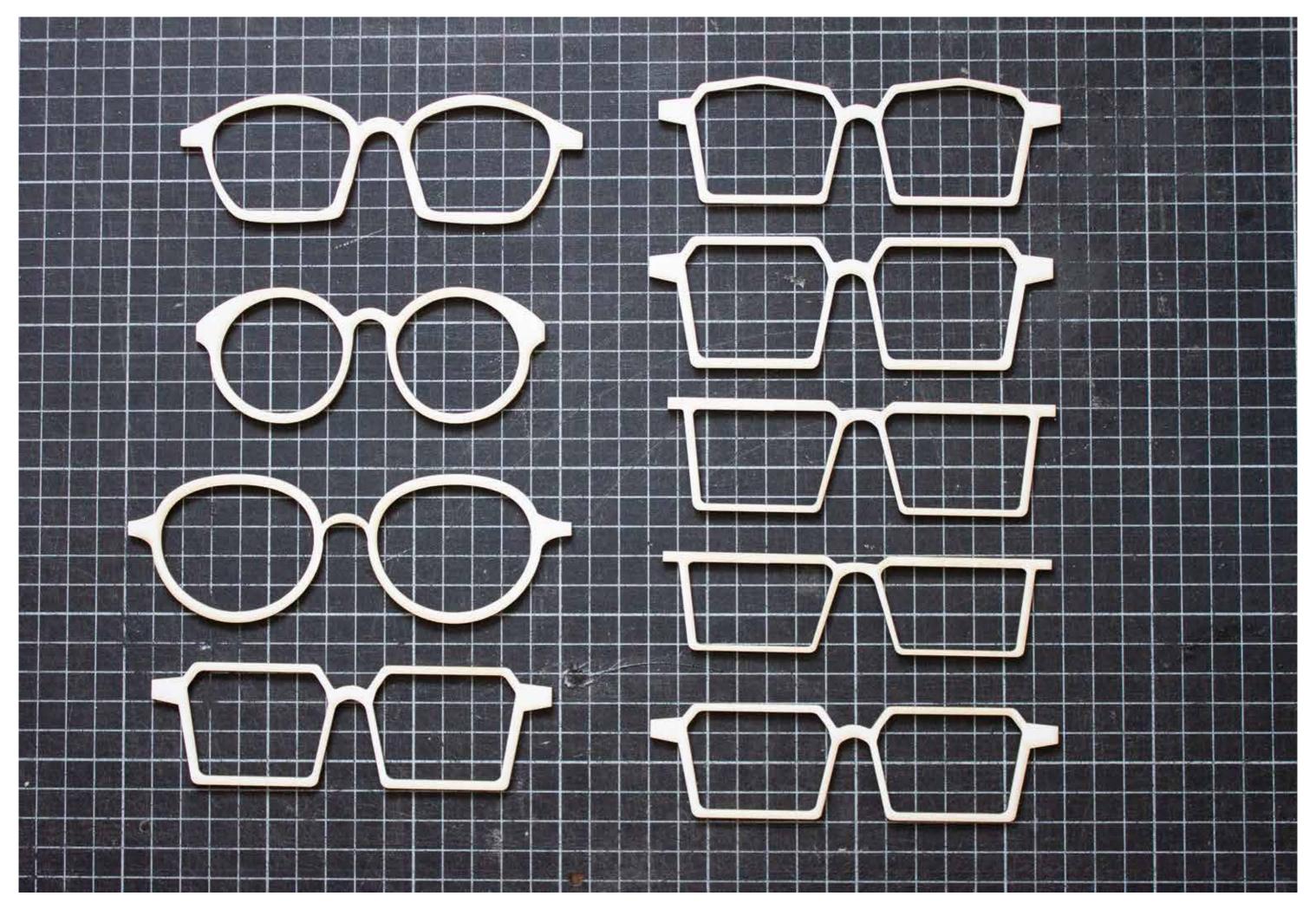


Before my talk with Smarteyes design team in Gothenburg, I already had some very geometric sketches. After they also told me that geometry in the frames is a great deal when it comes to trends today, I wanted to go even further with it. I didn't feel that my sports glasses were connected to round frames, I wanted to go for an edgy look. I also found a lot of geometric shapes in the sports world itself which gave me a lot of inspiration.

# **PROTOTYPING**

LASER CUTTING, FOAM AND 3D PRINTING

LASER CUTTING



LASER CUTTING









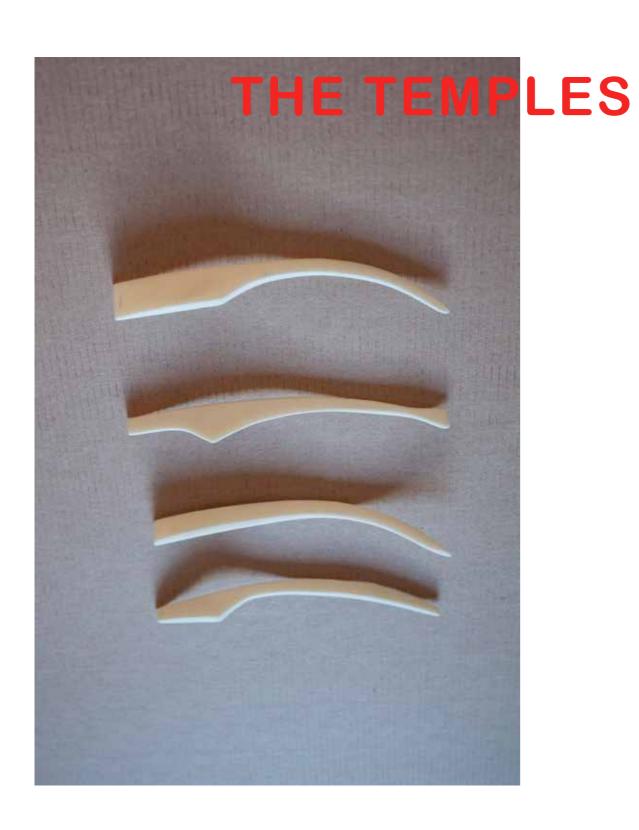








FOAM



I made some form exploration for the temples in foam. I wanted to add a sporty streamline into the temples but also keep it sleek and elegant as well. The one I went ahead with had the right edge to it and fitted the best to the whole frame.



3D PRINTING 3D PRINTING





3D printing has been the main tool for prototyping in my project. I worked in fusion where I used two of the laser cutting models. I did a lot of different measurements, different width, height, bending, etc. I also realized even more how great the 3D prints worked as a final material. It is very lightweight and can be made into a personalized final model for every face shape.

3D PRINTING 3D PRINTING



3D PRINTING 3D PRINTING







I wanted to see how my 3D prints would look on a real face. The goal was to make one prototype that would fit great but also look great. After this, I could make some refinements when it came to the width, height, the length of the temples and size of the nose pads. I choose to work forward with the red framed ones.







ILLUSTRATOR



This shape that has an angled top frame, worked the best with all of the different face shapes. The straight one felt too sharp and edgy. The rounded top felt not right either.







I also wanted to try out the different designs on different face shapes to get the best estimation of how they would look. This made my choice even clearer on what kind of frame I wanted to work with.

# THE LIVING HINGE

Since I was looking for sustainable materials and/or design, I had to look at my different options. At first, I did some experiments with recycled plastics, which didn't hold the same quality as plastics used in most of the frames today. It felt brittle and not as flexible. If I would have used the recycled plastics for temples and the front, I would have to use metal hinges and screws as well. This would lead to a mix of materials and I started to think about different ways to combine the parts. If I would 3D print my glasses, I could make the joinery between the temples and the frame a part of the design, without hinges and screws.

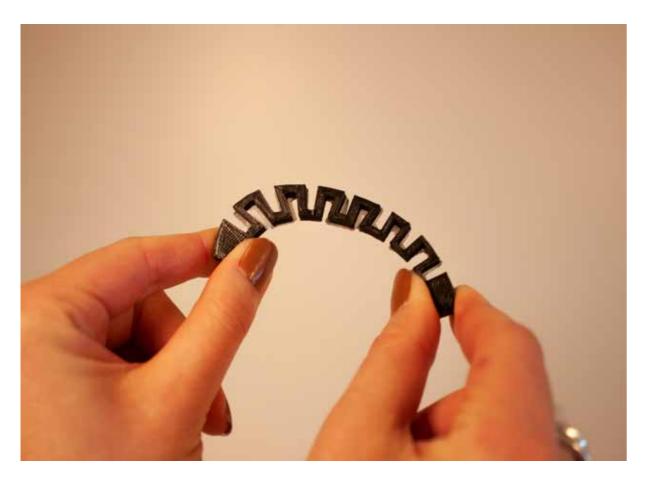
I looked at different plastic joints and started experimenting with these to see if it could turn out into something great.

I did some more market research on this living hinge concept for glasses and found some brands who sell them such as Ron Arad and GlassesUSA. Ron Arad has a focus on more contemporary design while GlassesUSA is more about the functionality and efficiency of 3D printing glasses in one piece. I wanted to try out different kinds of 3D printed joinery parts to experiment further with the design language of the frame.



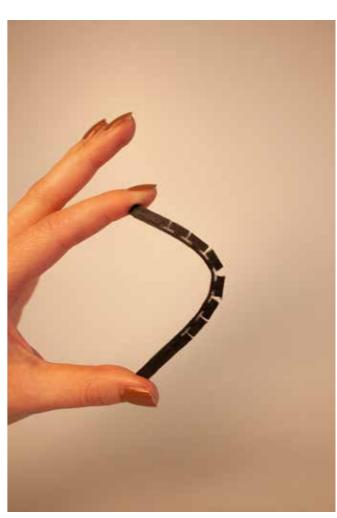


THE JOINT



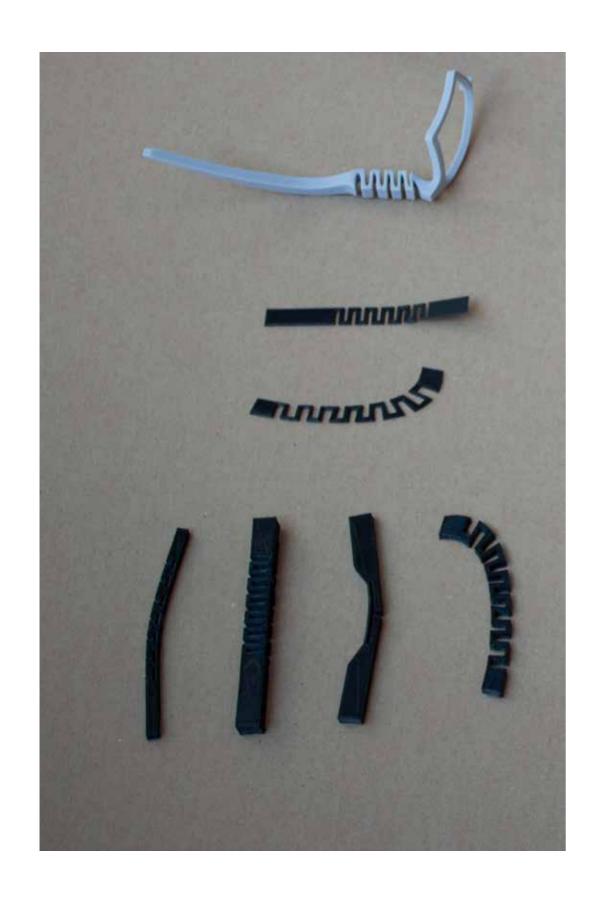


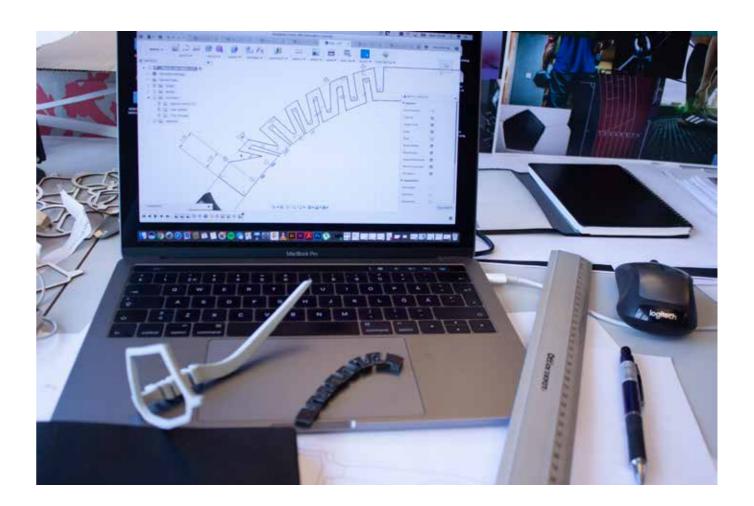




I printed out the different joints and tried them out. I found that the accordion joint to the left and the T-bend to the far right was the best-suited bend for a pair of glasses. I printed these out with a frame as well to feel the connection between the two parts.

THE JOINT



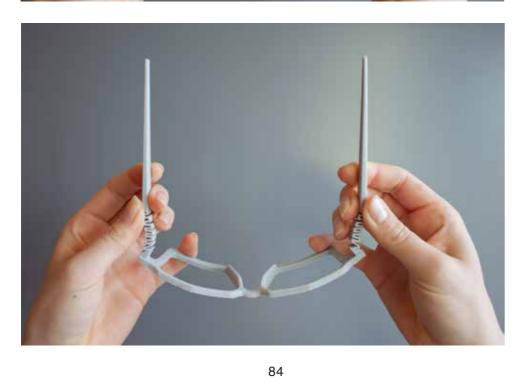


This is where I decided I wanted to have this kind of joinery between the parts, instead of hinges. But I still wanted to try out the CNC-milling machine with some recycled plastic sheets I ordered from a Dutch company before I went forward a 100 % with the 3D printed model.

THE JOINT THE JOINT













## THE CNC MILLING

I took a Fusion 360 file and CNC-cut it in recycled plastic sheets. After the CNC cutting, I had to saw out the pieces from the sheet that was connected with small bridges. After this, I sanded out the edges to make it smooth.

The result turned out good, though the material itself felt rather fragile since it is built up by a lot of plastic pieces which easy can come off. I would also have to use metal hinges and screws to put the pieces together, and this would not be such a sustainable option even though the material itself is sustainable. I felt it would be better to have the glasses in one piece only as a nylon print.



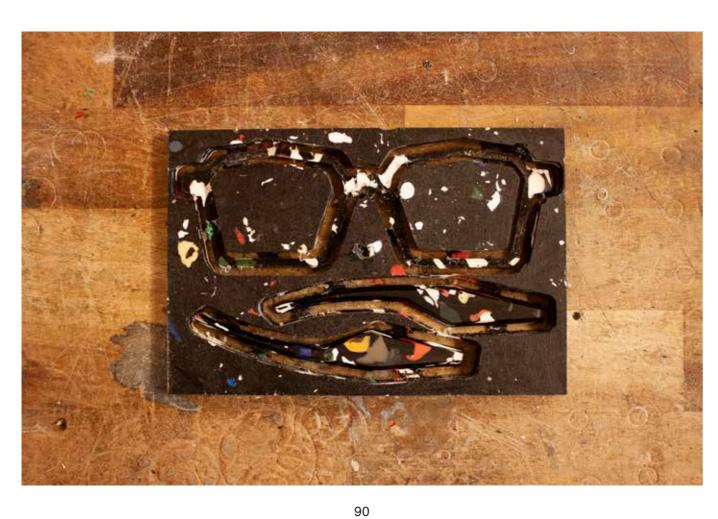
I ordered some recycled plastic samples from the Dutch company Plasticiet. I loved the terrazzo-like pattern in these and wanted to see how they would work out if I CNC milled the sheets.













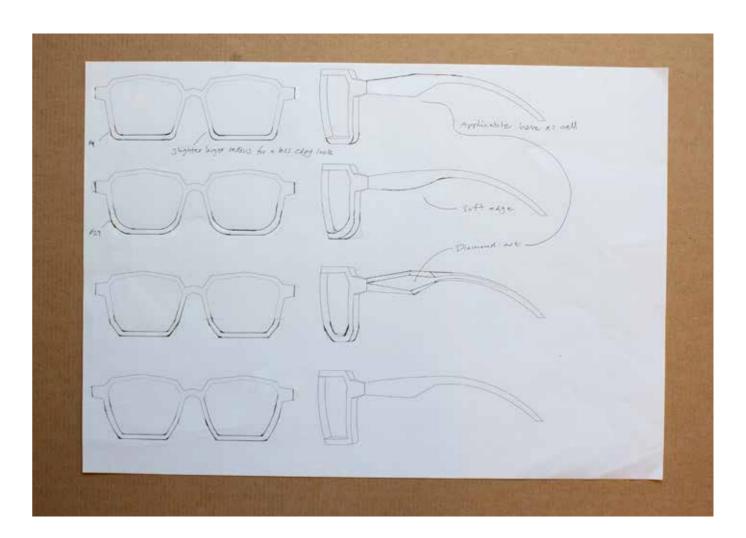
## THE DESIGN

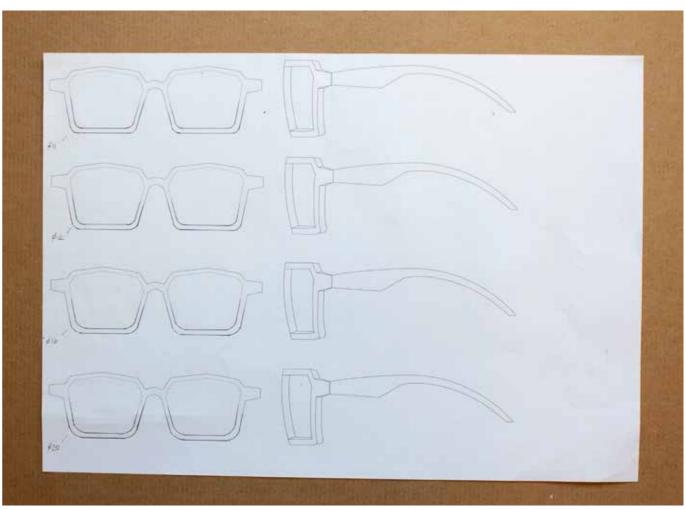
In this section I will go through my choice of materials, colors and the final prototyping.

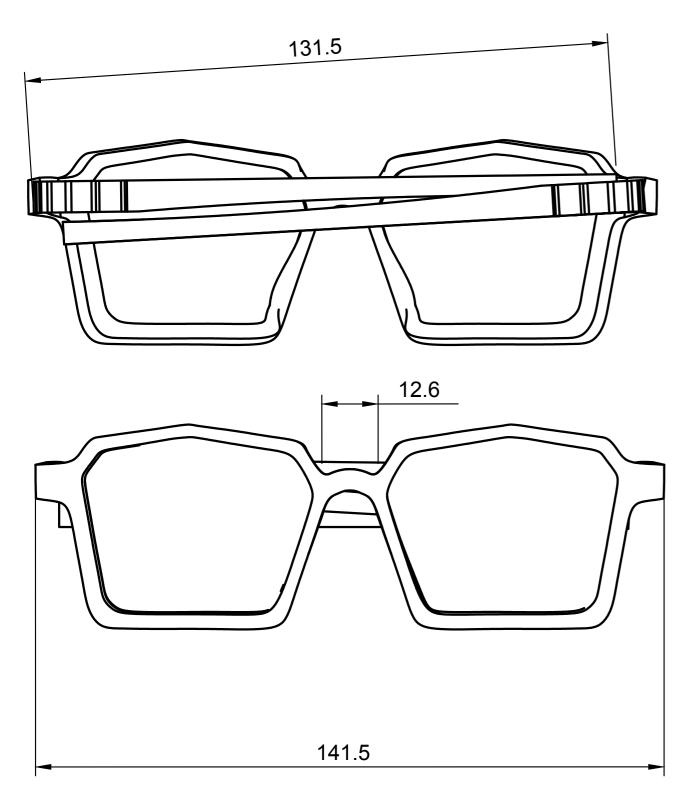
#### **REFINEMENTS**

I felt I could make some refinements into the edges of my frame. I made the radius bigger and tried them out on a sketching paper so I could visualize the differences.

94







96

#### **TECHNICAL DRAWING**

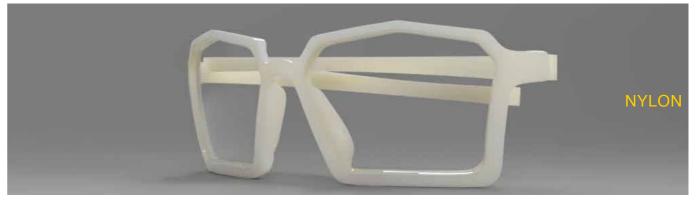
# MATERIALS AND COLORS

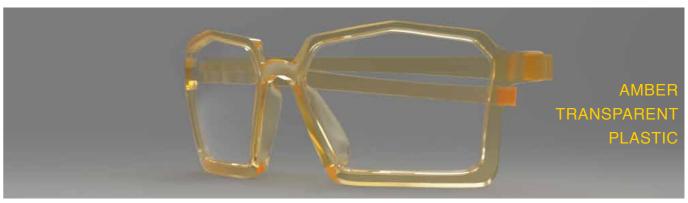
I rendered my glasses in different materials and colors to get a sense of what I wanted my finished prototype to look like. I decided to go with the matt plastic one since I felt it resembled the sporty finish I wanted to achieve. I also wanted to spray paint the ends in rubber (which would be matt as well), and therefore I felt I could spraypaint the temples outside the rubber coat part and with a clear coat to achieve a glossy finish just on that part for some distinction.











99

#### THE OPTIMAL MATERIAL

#### **NYLON TR55 LX**

RESISTS COSMETIC CHEMICALS AND PERSPIRATION

LIGHT AND HEAT STABILIZED

STRESS CRACKING RESISTANCE

ORIGINALLY DEVELOPED FOR EYEGLASS FRAMES

The nylon used in nylon prints is a great lightweight and flexible material. Although the tensile strength is not that great. Since my frame was going to be bent a lot I needed a material that could afford this. I found these headphones from Philips, which are made from a material called Nylon TR55 LX. This material was originally developed for eyeglass frames because of its stress cracking resistance, lightweight, cosmetic chemicals, and perspiration resistance and heat stabilization. This material would be ideal for my glasses since it would afford the bending and be perfect for especially workout due to all of its great properties.



## FINAL PROTOTYPING

This is where I went from the final 3D print I felt most satisfied with, to the nylon printing phase. The nylon print itself would be lightweight and work great with the living hinges. After this, I sanded it a lot, primed it and spray painted it in a matt black color. I wanted to add some extra depth with different coatings. I did a pattern on the temples and spray painted some parts with a glossy black and some parts in a rubber coating to get more friction in those places.

Before going into the final nylon print, I tried out two different kinds of hinges. The zig-zag (top) hinge and the T-hinge. The zig-zag hinge had too much pressure on the face temples and felt too bulky for my design expression. I tried out the T-hinge instead, which had a much better pressure on the face and also looked much more sleek, neat and minimalistic which I was going for in my design. I went ahead with this in the nylon print.









I wanted to add lenses to my frame to make the prototype complete and even more professional. At first, I tried to make them on my own in plexiglass with a heating gun. This created bubbles because of the heat and the edges were not as precise as I needed them to be for the trace in the frame. I went to an optician with my 3D printed frame and got good quality lenses that would fit my frame perfectly.

After I got the nylon prints, I went into the sanding. First I sanded it as soft as I could with a P 240 sandpaper, after that, I wet sanded it to get a clean and smooth surface before the spraypainting.









## THE RESULT

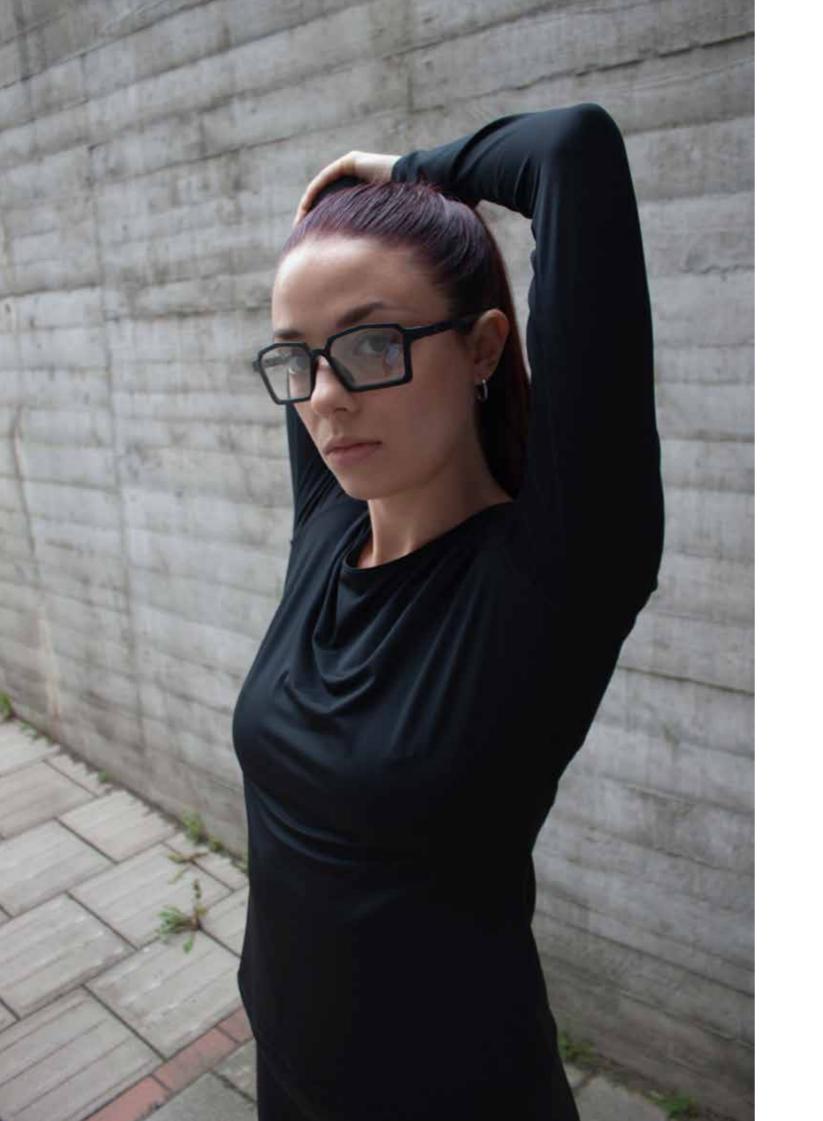


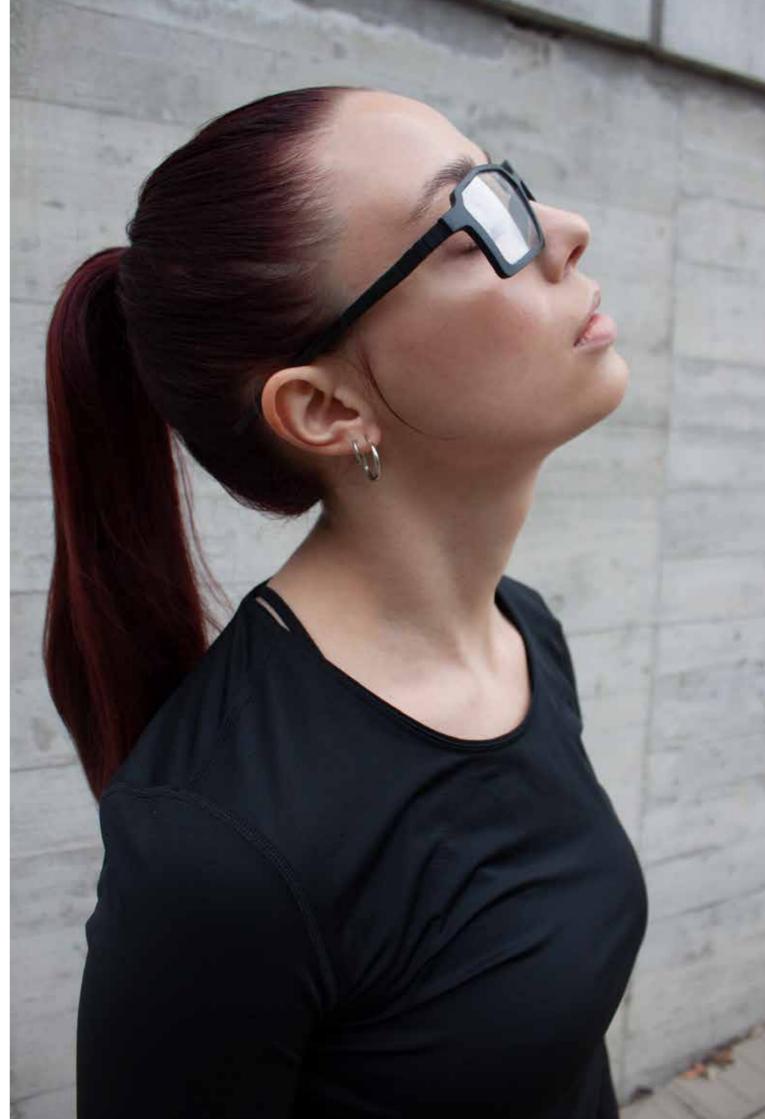


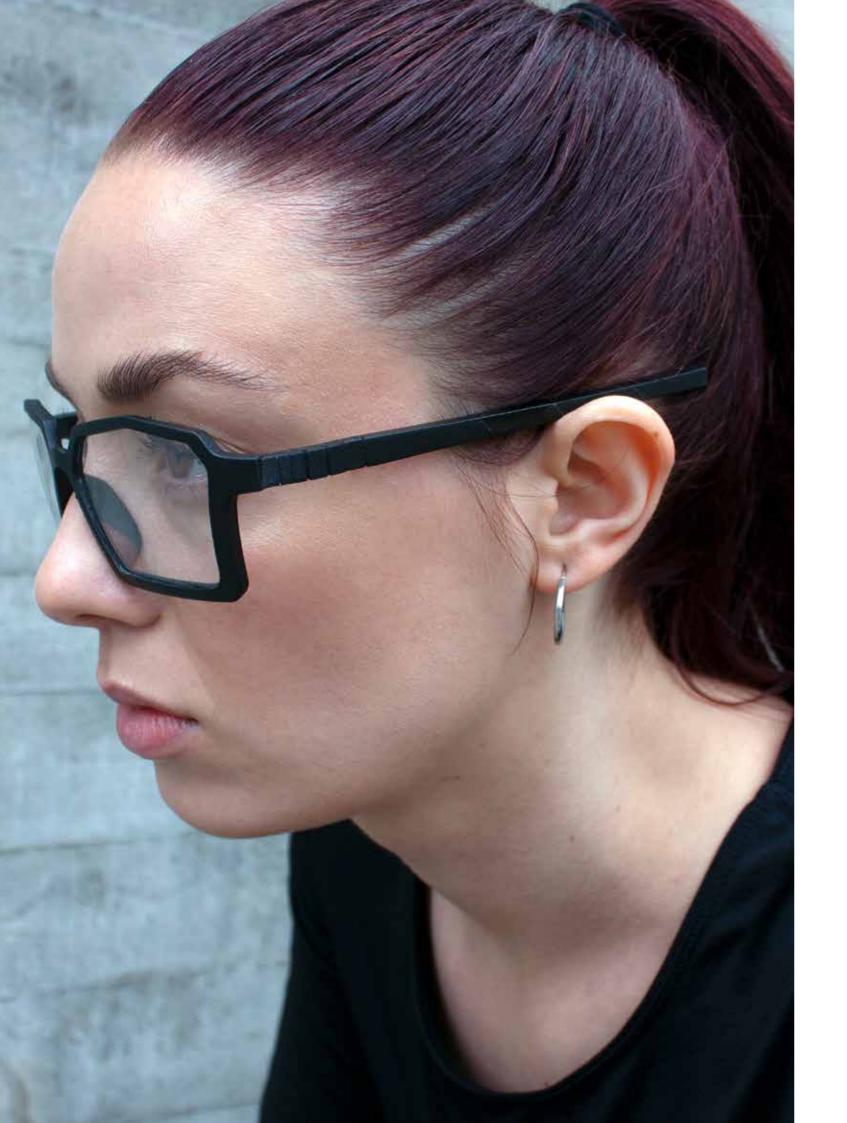


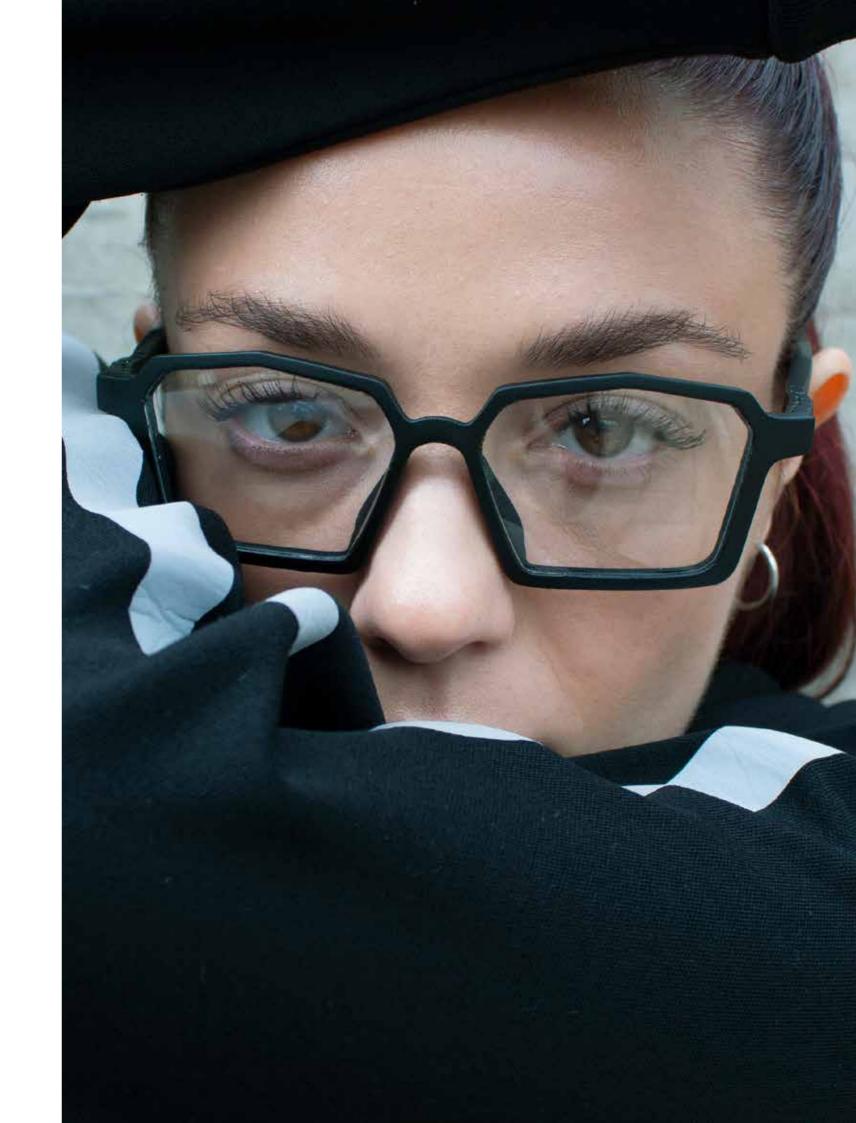












### DISCUSSION

This project has been an inspiring, tough, interesting and fun project to work with. The greatest realizations I got out from this was mainly how very complex glasses actually are, and how much work you need to put on the smallest details. It takes time and patience to complete a product this detailed, but in the end, all of the sleepless nights and frustrations about the perfection is worth it.

I am satisfied with the fact that I managed to make the glasses in one piece, and that I went away from the sustainable material and instead focused on a sustainable production. Allthough one further progress could be to combine both.

One thing that could be added to the glasses are different sizes. At the moment they are only in one standard size. If I were to make one a bit more narrow and one a bit more wide, it could be a collection aimed for three different face sizes.

### REFERENCES

TARGET GROUP PICTURES P. 14-15

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SPORTS EYEWEAR MARKET PICTURES P. 22

OAKLEY .COM

SUNPOCKETORIGINAL.COM

BLIZ.COM

FATPIPE.FI

PRESTIGE.SE

SPORTS EYEWEAR PICTURE P. 25

WEB: 11/6, EBAY.COM

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FASHION EYEWEAR MARKET PICTURES P. 26-28

MOSCOT.COM

NIVIDAS.COM

SMARTEYES.SE

FUTURE EYEWEAR GROUP PHOTO OF JAN JONSSON P. 38

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skifte-pa-future-eyewear/)

ILLUSTRATOR EXPLORATION FACES P. 75

PHOTOS BY: ERIC LUCATERO

JOE ROBLES

MALVESTIDA MAGAZINE

**EDWARD CISNEROS** 

PLASTIC MATERIAL FROM PLASTICIET PHOTOS P. 88-89

PLASTICIET.COM

#### **THANKS FOR READING!**

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