A Collection
Of Rims

Bachelor
DESIGN
Thesis

by
Victor Nyström
FOREWORD

This design project has been rewarding and fun in many ways. I’ve put design methods into practice and seen how they sometimes have to be bent around a product in order to fulfill their purpose. I’ve gotten knowledge in how a design and manufacturing-based company cycle around the topics every day. I’ve come to realize that parts in my methods would sometimes not be my job, but also fields that nobody seems to think about where they would help significantly. This real life experience is one of the things I value the most after this thesis. It was also a personal boost to realize that I had experience enough to do a good job, that all the time I’ve put into developing myself was not in vain. I’ve gotten life experience, seen the world in a new way, got new friends and valuable records for the future.

I saw a special set of wheels being milled, painted and assembled at the shop during my time at the headquarters. Then, the same weekend, they were mounted on an eye-catching car. That is a feeling I would like to re-experience but with my own wheel designs.

I would like to thank Yuri Ranum for his fantastic hospitality and guidance during my time overseas. Also the other employees at MHT and Rotiform that made it possible to carry the project through, and plus the financial sponsorships. I would also like to thank Jan Lövgren for help with the presentation model and Michael Hardt for guidance and directions every week. Finally, I could not have done this without all my design friends at school.

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THE PROJECT
Four rims

The interest of cars as a hobby has been increasing over a long period of time and is continuously growing stronger. There is also professional business garages that offer help to enthusiasts. This even though modern cars is getting more and more complicated to work at and give a personal touch. But one thing that still is as easy to change now, as it was 80 years ago, is to replace the wheels. Furthermore, the vast majority of car enthusiasts agree to that ‘The wheels makes the car’. That means a great deal of the car’s feeling lies in the rims. The car scene is, as many other interests, depending on fashion and constantly demanding news because the customers always strive to be unique.

The goal is to develop and design a collection of rims that is on the top of the modern customers’ needs according style, function and quality. The designs will be designated to Rotiform which today is amongst the top class in their scene of aftermarket rims for cars. It takes a lot to maintain the status and they must therefore widen the assortment after the users’ needs.

The vision with the project is to affect how car enthusiasts choose to express their personality via modifications to their vehicles. The result will be a collection of four wheels that is attractive on the market with focus on a certain style of cars. If my vision is to be achieved it is required that at least one of my designs is being produced to reach the focused market.

THE DESIGNER
Victor Nyström

Over the years I’ve spent plenty of time in workshops where I’ve enjoyed working on my vintage cars, building sculptures and models. The style and feeling of how object looks have always been crucial features to me. I’ve never really wanted the fast car, just a good looking one. That is why this project suits me so well.

Product design attracts me in many different ways. I like the development process with analysis, sketches and tests. I watch and reflect every day on how people interact with objects, why details are made the way they are and how things could be optimized. With such a high percentage of designers working in digital nowadays, it makes me highly appreciate the result of a physical product. One you can truly feel and proudly see others use.

In 2013 I attended Ölands Folkhögskola for one year of general art & design studies. I found and picked this more creative choice ahead of my ongoing design engineer studies. Fortunately I loved the life at the school and having the studio just across the yard were the best thing. The program’s width showed me the big picture of design and art whilst narrowing it down to what I wanted to do. One year later I began my Industrial Design Bachelor at Mittuniversitetet and this will be my thesis for that program. With four years of design studies, and a short but beloved course in the art of blacksmithing, I have found out what my goal is and what it takes to have a shot at it. I’m attracted to mechanical features, ergonomics and interactions because I think that gives a product more life, more to refer to during the process and therefore a more innovative challenge.
MHT was founded in 1986 and now has six brands under their umbrella. The brands together offer a wide range type of wheels that is covered on page 10 and contains several car scenes. They produce all forged wheels at the machine shop in their headquarters in southern Compton, Los Angeles, California. Everything from the first sketch to milling raw aluminum, polishing, painting, packing and shipping. The time from a first sketch until the wheel is sold varies a lot. Sometimes the process is just about a month if a series of concept is being requested because the market department finds a gap that needs to be filled out, and occasionally a design is made after being printed and pinned to wall for years.

They have engineers that builds 3D models as accurate as possible to the designs, if it’s not done by the designer himself, and run tests to make sure they won’t break. Each design has to pass three virtual tests, cornering, impact and radial forces. The forged models are not tested physically, since the metallurgical properties make forged wheels much stronger. Cast models have to go through physical tests to, as cast metal has a crystalline structure that is more brittle. This also works because there are much fewer versions of a cast wheel.
Brian and Jason founded Rotiform in 2009 and it is a well-known brand in the modern custom car scene. Rotiform was sold to MHT in 2015 which let them grow faster and to a point that wouldn’t be possible without the distribution and financial backing from MHT. Even though they are under MHT’s umbrella they still decide themselves in what direction they want to take the company.

Rotiform’s first design was created at an airport and therefore they named it after the three letter airport code. That was the root of their naming system which they still follow. Except a few models are clearly inspired by existing wheels which got codes that reminds of the original model. The first designs were made by the founders and the vast majority still are. They rely on feeling and their personal experience when deciding what to be manufactured and what not.

At the moment they have got around 80 designs in their catalogue but they all have plenty of variations and selections depending on what the customer is looking for. It is not often a design is removed.

To the right a few of their wheels is displayed. They call the form language ‘Retro Modern’ because plenty of information is gathered from clean shapes the 80’s. Then modern aspects is added to make the wheel attractive to the present market. Things like concavity, sizes, material and coating.
Wheels that are seen every day on the streets and that come on new factory cars is called OEM wheels, Original Equipment Market. They are often cheap, cast, no concavity and comes in a silver painted finish. They rarely come in diameters over 17” because stock cars often have a high tire profile.

The aftermarket contains several different styles depending on which car scene it’s designed for. Since enthusiasts buy an aftermarket wheel to put their own stamp on their car they usually want it to show they put a lot of extra money into it. Therefore the aftermarket wheels looks more exclusive.

To the left are six examples of styles taken from MHT’s brands. They have different target groups in focus, even though they cross each other’s paths occasionally.

Niche is a brand that by the looks is fairly similar to Rotiform and comes in many different colours. The big difference lies in the target group where Niche is aiming towards slightly older customers that want to make an easy modification to their more luxurious car.

Fuel is aiming towards the off road type of cars and trucks. They have a very aggressive and technical form language and often mostly in black.

DUB has styles that includes plenty of chrome, extreme dimensions and strong colours. The purpose from the beginning is to look as expensive as possible.

US Mags has the focus on American vintage cars and trucks and keeps a traditional form language to their designs. The scene wants a slowly evolving pace but they offer a series of remixes of traditional wheels but in bigger dimensions.

Foose has a lot of chrome wheels and barely any color. The main customer is looking to customize an old classic car into a more modern looking vehicle. A target group with a relatively high average age.

Below there are merely four simple illustrations how the basic shapes of rims has changed over the last decades due to trends and demands and so on.

In the 80’s the dominant forms were rather abstract and boxy. Plenty of flat and full face designs with windows. Turbo wheels with discs and diameter around 15” were also common. The wheels often referred to nowadays belong to sport cars of the time.

In the 90’s the organic shapes became dominant in the same way the car industry became affected by how easily 3D-programs could make and handle curves. That sometimes shaped cars like soap, and so also the wheels when the new wave of aerodynamic design took place.

From 2000 and onward the street racing era was very noticeable. In this era the market for custom aftermarket parts for modern cars exploded in popularity. Also for aftermarket wheels. It is easy to refer back to early Fast and Furious-movies to get a brief hum of the scene. The wheel design is clearly inspired by motor sport. Lightweight, thin spokes, mechanic influences and sizes around 18”, therefore fast.

From 2010 the wheels got drastically wider and with more concavity. Cars from this era has no problem to swallow bigger wheels and the average diameter rose to about 20”. With the ongoing trends the design is usually kept clean without unnecessary details.

The wheel trends is constantly moving like any other fashion but often lasts for two or three years. Rotiform is clearly inspired by clean shapes of the 80’s but with modern, concave and clean look of the 10’s. Therefore they sum their form language as Retro Modern.
MANUFACTURING

Materials

Aluminum alloys is by far the most dominant material on the market now, before that steel and magnesium were common. MHT only work with aluminum alloys now. It's a light material and preferable in many ways when it comes to price, malleability and durability. An alloy is a mixture of several materials to enhance wanted attributes. Königsegg makes some of their wheels completely in carbon fiber which makes them very light, strong but also expensive and time consuming when produced. There is now also tests being made for 3D-printed rims for concept cars.

Processing

At the headquarters and factory in Los Angeles the rims are manufactured only by milling. It is a rather time consuming technique but have its pros when it comes to unique designs and sustainability. They are called forged, that is because the raw material is first melted into big cylinders which later is forged almost flat. This makes the alloy very strong. The discs is put into a big lathe and shaped into a basic, balanced shape for the planned design, followed by the final milling that is done in several steps.

They also offer cast options due to the economic advantage in batch production. A mold is created which then can be used numerous times to pour molten aluminum into and make the same design over and over again. The mold is expensive to build but usually pays of fast.

Coating

When it comes to surface treatment there are numerous options available on the market. Rotiform offers liquid paint, powder coating and different clear coating techniques. Sometimes the material is brushed, polished or left raw.
DIFFERENCES

Attachment - There is a handful of ways to mount a wheel to a vehicle. When the car was new a common way was the 'knock-off wheel' a common feature, through the 30’s thru 60’s where many ‘low-rider’ cars used it, and still do. But it is a vague technique which neithers spread to other cultures nor followed to the later days. In motorsport a similar method is used. It is called ‘centerlock’ and is recognized by its one big lug nut in the middle of the wheel. This is partly to save time during pit stops. It gives a very clean and stable impression which is why it lately spread outside of the race track. Even though it is only Lamborghini and Porsche that offer centerlock as original equipment. A centerlock wheel is much more complex on the back side compared to a regular wheel and they also needs several special tools for mounting. But there are aftermarket conversion kits for those who wants to pay. Most people don’t, especially since several wheel manufacturers offer caps that gives an illusion of centerlock. They have over the last years become very popular. The absolute most common way is a series of 4, 5, 6 or 8 lug nuts or bolts. It has been used for decades and is now the superior way in many aspects. The market is broad and offer lots of accessories and standard measurements.

Bolt pattern – The bolt pattern changes a lot depending of different cars and is a crucial thing to know what you have. It is always the number of lugs, five in this case, and the distance between the two points, 112mm for this 2017 Audi A7. It can easily be converted between inches and millimeters.

The barrel – The overall width to a wheel is often set by the barrel. They come in various sizes and materials just like all other parts. It is up to the customer to pick an option of measurements that will fit their vehicle. A forged wheel that are made specifically for a customer have a lot of influence on the result since the barrel contains of two pieces. One front and one back piece. Cast wheels are more limited, even though they are made in a number of different widths to fit several cars, bolt patterns and tires. There are different types of lips, the front end of the wheel where the rim meets the tire, on a barrel. There is for example reverse lips, which is simply a straight lip with great depth and step lip which is popular for floating spokes. Now it is also common that a wheel has no lip, known as flat face, where the spokes goes all the way out to the edge of the rim.

Mirroring – Rims with a design that is not completely radial but with a certain twist or rotation will be perceived as reversing on one side of the car, unless they are mirrored during the production. Forged wheels is more expensive from the beginning due to its production method and does not add any significant extra costs when mirroring. Cast wheels do. Always making double the molds will raise the costs considerably. Furthermore, if the front and rear wheel would have different offset or concavity as well it would be four different molds for one set of wheels. That is why common cast wheels is not mirrored.

Assembly – Split rims is always carefully assembled in Rotiforms facilities. They usually contain 40 bolts and occasionally there are a few hidden bolts that is threaded from the back instead. The bolt torque is 18–20 lb.ft. Every wheel is also balanced to make sure it is round and road worthy with a tolerance of .02” to be approved. On some wheels the face is welded to the barrel.

Client – Bottom line, the customer have a lot of options to look for. They can tailor their own personal rims from the ground up or buy a pre-made set of cast wheels. It is just a question of budget, demands and ambitions. They fulfill the design.

Below are four different variants of the model IND-T.

#1. Cast, powder coat
#2. Cast, 3-piece, step lip, liquid paint
#3. Forged, 3-piece, sandwich, liquid paint, polished step lip
#4. Forged, 3-piece, front mount, rear bolted, brushed, polished step lip, floating spokes

Differences – It’s not unusual that several differences is made out of one design, and sometimes they differ a lot. Often it’s about making a cast and a forged variant. Furthermore, a series of different faces is sometimes made to give the option of different mounts, like floating spokes, sandwich, 2-piece or with a deep reverse lip.
During two weeks in March I left the Swedish snow for a visit and a shorter internship at the MHT headquarters in Los Angeles. This was a truly rewarding trip that brought me closer to the entire project and made it come to life. It was two busy weeks to be able to catch as much information as possible. I spend every entire weekday at the HQ sketching, documenting the facilities, talk to employees, trying to understand the production line, learn about the process and simply ask about everything.

The weekends offered even earlier mornings because I attended several car related events. Good opportunities to study the target group and even more documentation, also talking to customers.
Events

During this project I’ve been visiting a series of events to meet the southern California car cultures atmosphere through my analysis goggles. I spoke to customers and dealers, documented the competitors and what wheels I saw. Shapes, styles, colours. What kind of cars and what kind of owners. Even though a few shows where lacking the target group I found them valuable.

I attended Clean Culture season opener in Costa Mesa. A big event with hundreds of showcars. Plenty of brands and dealers were exhibiting wheels and parts. Street food, people and sun.

The XS Carnight, located at a park in central Long Beach. Relaxed atmosphere and a much wider spectra of visitors due to the public location. No cars outside the target group, very valuable and rewarding.

Cars ’n Coffee in Mission Viejo is one of many weekend breakfast meetings and offered the widest range of attendants and vehicles. Interesting because it have a different feeling when it is not as organized as the others.

Friday nights at Big Boys in Burbank is always an opportunity to meet with other car enthusiasts. Unfortunately there was barely any matching cars this night. But definitely plenty of wheels and inspiration and a magical, nostalgic atmosphere.

The same goes with Odd Squads Dogtown Rumble in Venice beach. A different scene with only vintage cars, but the atmosphere of Californian car culture is strong.

At the Petersen Automotive Museum in Hollywood I had the chance to study wheels from all times and genres. A great museum and also with a studio for vehicle design run by ArtCenter college of Design. Inspiring environment for sure.

Also Bilsport Performance & Auto Show in Jönköping, Swedens biggest indoor show with over 75k visitors over a weekend. They show a huge spectra of different car scenes and I did of course find what I was looking for.
I started by listing as many big, active wheel brands I could come up with that aimed towards the modern car and racing scenes. A number of racing games were helpful when trying to find companies that are big enough and also in the same genre. The 40 most interesting results were filtered out by visiting their web pages and analyzing their form language, quality, origin, target groups and popularity. This left a manageable number of interesting and active competitors.

Furthermore several additional brands was found at the visited car events. Some became relevant because they or dealers simply sold their products at the shows. Others were noticed because a huge number of cars had certain brands.

It is the specific car scene that make these brands to competitors. They visit and display their wheels where Rotiforms target group can be found. Some of them is also located where their targeted car culture is strong. But internet is of course the biggest platform in this matter.

BBS is a German giant in the market, with roots back to 1970, and well respected in the branch with a number of iconic models. Vossen, Ferrada and Veemann is young but fast growing business and with a very similar target group. Klutch, Rod8 and Messer have several bold designs that sticks out even among aftermarket rims.

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TARGET GROUP

Who they are

The main focus for Rotiform is where modern, low and stanced cars is. Therefore the real market is people who owns such vehicles. After observations some conclusions could be made. They tend to be mostly men, no matter where in the world. Most of them is between 20 and 35 years old. It is people that want to express something with their car. They spend lots of time and money in the hobby, living the lifestyle with cars in focus. When the cars is what tie friends together and become something more than just transportation, it’s a feeling of pride. It is rewarding to create this form of art which actually is usable, mostly, and the community is huge.

There are uncountable sources online where the target group roam. Not only the usual social media-sites but plenty of webpages and forums for meetings, wrenching tips, and pictures with stanced cars in focus.

There is also companies that customize cars which sometimes buy wheels. It is not unusual that they want to be the tip of the spear trend-wise and almost shaping it.
CONVERSATIONS

Summary

To get a better picture of reality and some expert inputs subjective conversations has been conducted in the context of this thesis. To see how the trends are moving and how users think it was very necessary. To professionals questions about form, trends and construction were asked. Meanwhile opinions and thoughts was gathered from customers regarding the company, product feeling and usage. Information has been coming in all the time from many sources, but on this page there is a summary of the more formal conversations made.

RYAN
Spokesperson – Ferrada

The trend will continue with concave wheels and also with a ‘lip’ and sometimes "frosting spokes”. Up means that the spokes does not go all the way to the edge of the wheel but with a step, like on the A5 below. Floating spokes is when the spokes are hanging over the lip without touching it. That makes the wheel loose offset and therefore exclude certain car models. They put a lot of effort into design process and developed a special series of wheels to include them as well.

JOSEFINE
Dealer – SC Styling

They only sell cheap, cast copies of existing wheel designs and they sell plenty of them. “Why pay more if they look the same?”. She believes the next trend will contain more lip and definitely more colour, also more polished finishes. Believes a trend lasts about three years and it’s time to move on from flat face in about a year.

HENRIK
Dealer – Rotiform IND – Audi A5

The car is a daily driver, back and forth from work. He enjoys it very much and it works really well with the car on air. He doesn’t care about the cleaning part when he buys wheels, just want the coolest ones. It’s not his first set of Rotiforms and it won’t be the last either. He tries to buy a new set of wheels every season and thinks it’s worth to buy forged ones.

ANTHONY
Dealer – Royal Speedshop

Flatface has been around for some two years now and begin to lose its popularity. Customers tends to want rims with a lip now. Aodhan is new on the market but a big competitor to Rotiform with their cheaper copies and they are also located in California. Believes that it will keep on going towards more extreme wheels and agrees to upcoming organic features. More concavity and even wider due to the Liberty Walk wide-body trend that is growing strong.

YURI
Designer – MHT

Believes the turbo and disc wheels had their time for now. Also that the full architectural style was hit with the Rotiform KPS which has been sold a lot lately. Therefore the trend slowly will turn towards more organic shapes, but in a different way than the 90’s maybe.

PATRIK
Rotiform NUE – Audi A4

Bought Rotiform because they look very good. They are not cheap copies but also with an affordable price. He likes the retro modern look and loves the modern remakes Rotiform does. He would like some bigger forged rims but they are more expensive. The car is a bagged daily driver and sometimes the wheels gets dirty but they are fairly easy to clean because the spokes does not have any depth. The amount of spokes does not matter, it’s more about how deep they goes. Thinks the trend will go towards wider wheels because modern cars can take it.

Collin Mill, 27

1965 VW Beetle
1999 Lexus GS300 on air
2011 Chevrolet Duramax

Persona

Family
Have fiancé since two years ago.

Living
Apartment in Orange County, CA in which fiancé also just moved in. Carport but also external hobby garage 5 minutes drive away.

Occupation
Works fulltime with logistics and with a steady income.

Interests
Cars, video games and friends. Most friends also like cars and share garage with some of them. Plenty of time is spent there.

General
Spends most money on the cars because he have no severe expenses for family or other expensive interests. Put some money away every month for the future and saving for a house. Attends a dozen car shows every year with the two hobby cars.

Collin Mill, 27
MARKET

Stance

The biggest trend in the modern car scene now is often called Stance, which come after the street racing trend before. Rotiform aim most of their focus on this scene and cars that is customized, and most often very much lowered with either coilovers or air ride. The stance refers to how the vehicle "sits". Fitment is crucial, that is how minimal the gap between fender and outer rim is. This fashion does not include as much body mods as the previous trends, but is more about keeping the car clean from unnecessary accessories and spoilers. Most of the cars in the scene is newer than 1990 and origin from Europe and Japan even though it is incredible big in the United States. But of course there is plenty of exceptions.

Current trend

After the huge analysis phase with conversations, observations and so forth it is still impossible to make the perfect wheel in such a moving market. What is possible is to adapt to the trend and maybe try to start something new by challenging it. Listen to the audience but also put personal confidence in the esthetics. It has been hard for people to reflect on what makes a wheel attract or repel them, and even harder to summarize it. It is such a personal opinion and the market is full of choices. Although, many agrees that the concave shape will remain and wheels will get wider & bigger. Flatface spokes will be replaced by more lip and the overall shape will turn into a more organic feeling in some way. The market for turbo and disc wheels might also be saturated by now. What is not saturated is the colour. The curve of painted wheels will most likely increase.

Export

Rotiform sell a lot of their products in the US, especially California and Florida. But a big part of the market is within Europe with countries such as Germany, England and Austria at the top. That is because plenty of the cars they focus on origin from Germany. Neither MHT nor Rotiform sell wheels directly to the customer. They are a business to business corporation which always let the customer go through one of their authorized dealers around the world.
GUIDELINES

Both the project and the design need a framework of guidelines in which to relate. It gives a good view of the situation and ensures nothing is forgotten.

A demand specification was set up to concentrate all needs for the wheels. For example, the design should attract the target group to be successful and the wheel shall pass the abrasion tests. However, Rotiform does not have any strict rules for total weight, like some other brands.

Furthermore, an analysis of how a wheel is handled by a customer was made. All the way from unboxing to using and selling.
I believe that the source of inspiration did not really have any big demands in this project. It never turns out well when a rim is given the shape of something else that is easily recognized. Because I am both interested in cars and always have my eyes open for interesting shapes in the everyday life I simply choose details from interiors and workshops as a discrete inspiration source. There are round objects like small wheels everywhere. This source give a better chance of finding a new interesting design rather than being inspired by mechanics, speed or the nature, for example. Sometimes I also got inspired by other rims that I found remarkable, even though that was not the goal.
A well done front view with shadows, highlights and some colour gives a sketch good enough idea of how the shape looks. That is why it’s worth spending some extra time from start to find interesting shapes. Next page shows some of the discarded sketches during the process. I’ve used Photoshop to visualize them and given them an average of 40 minutes each. They are idea sketches but with a higher detail ratio. The detail ratio is the same for every sketch to make sure they are equals to each other. Around 40 sketches was made from the beginning. It never felt enough because of all the ideas that kept on coming and there were many types of designs that felt missing on the bulletin board when it was time to proceed. Time was running out and at some point a decision had to be made.
Proceeding

By printing all sketches and pin them to the wall it was easy to get a general view of the suggestions. I summoned several design interested persons to vote and rank their favorite styles. By the results I could pick the most popular ones and continue making sketches around those.

The suggestion with bouncing spokes was one of the most popular. Appreciated by several women which was interesting because it might be one way to widen the target group as a bonus.

My rotary variant of the Volvo R rim were found interesting because if its fan-like spokes and the audience wanted something more turbine like.

They also put attention to the multi spoke designs, because of a more traditional motorsport look.

The same went with the last five spoke suggestion which partly were my complimentary emotional choice.
It was well-known that building the models straight out of the front view sketch was going to be difficult. Therefore the modelling became a broad phase. Not only the four final models was made, but fifteen. They became more detailed, realistic and good looking over time, partly because of experience and knowledge of the design. In this stage the last choices had to be made, which four to present. To the right is the four final concepts in an early stage of 3D-modelling where enough potential was seen in them. Later they were completely rebuilt and optimized design wise. One of them also had to be built extra carefully to be able to 3D-print it as a presentation model.
CONCEPT THOUGHTS

A brainstorm about what could be altered with a wheel was done. How to make it look like something nobody ever made, like a producible concept. An aspect to make the designs not like all the others was wanted. Yet still keep it relatively realistic but neither childish nor tacky. There are already features like spinners, floaters, lights, and so on which were not interesting at this moment.

There was ideas of playing with springs or coils on the spokes to give them different looks in different stages of movement. Interesting thought but would take too much explanation and guessing.

Forged wheels is often divided into three pieces, so there was thoughts of making a four piece rim. Maybe a sort of concave shield behind the spokes up towards the disc brakes or an extra set of spokes to make interesting overlaps etc..

An other interesting idea was to push the limits by adding as much asymmetry as possible. Make a hole in one spoke only and move the material to the back side instead to make sure it was balanced. But there was no way to test it in practice at this moment. Since it takes such small weight differences to notice an unbalanced wheel it would have been unserious to present something untested.

Instead the existing designs were given sort of an extra dimension by adding a bit of extra concavity and radical form to add a slightly conceptual look.
RESULT
The KRN model gives an impression of a creature, crawling with it’s pikes, when they move towards the rotation. The design is more mechanically structured than first expected. Organic elements comes in other ways than the 90’s style but still contribute a lot to the piece. The pikes is flat by the tips but with a major concavity towards the center. It gives a luxurious impression due to the complex shape. This example have a deep step lip with floating spokes. The name origin from the northernmost airport in Sweden, Kiruna.
Flat pikes
Floating spokes
Contrasting edges
Creature-like knees
The VST model is inspired by milling tools, turbines and fans. The deep reversed lip along with cavity gives a light feeling of air and movement. The angle of the flanges gives the wheel a traditional direction, but the thickness fools the viewer with discrete differences on each side. A small notch was added to give more life to each spoke.
The ARN, here visualized with centerlock. The least crazy design in the collection but not the least luxurious. It has flat surfaces that gives a thin and light impression which also creates a continuing movement outside the wheel. They rest upon a solid foundation which hold up the center. The mechanic shapes along with the bolts brings the mind towards an imaginary reactor.
This design may challenge the user but will certainly give style in return. Building outwards not only gives it a rare and raw look, it also gives it a new shape when seen from the side. The forty spokes gives a strong impression, partly because of the numbers but also their depths. It is directional but still work both ways because of the angle of the outer holes. That is why it work well as a cast wheel, as displayed. It would also save material when cast because of the concavity and depth of the spokes. The shapes that appear because of the depth at the bottom draws attention for sure.
PRESENTATION MODEL

To let the most appreciated design express itself even more a fullscale model was built. It was important that it was fullscale, 22 inches diameter, to get the right massive feeling of it. Also to show the living shapes, depths and how it changes from all angles.

It was surprisingly hard to find a barrel in Sweden that could be used as a foundation for the model. I called several dealerships, spoke to people in the industry, searched for ads and second hand wheels. Even looked for different racing team garages nearby but there was not a single barrel that anyone could lend or sell me. And it’s difficult to buy just one wheel from anywhere but a dealership. Split barrels is also expensive. Making a barrel from scratch in less than a week would simply not be possible, especially with the finish requirements. The barrel was then donated by MHT which made it possible to make a full scale model.

The spokes was 3D-printed from a detailed and solid model in Rhinoceros built to fit the existing barrel. It was divided into five segments because of the printers size limits. They were printed separately and put together by hand. Then sanding, and other surface treatments were made before it was painted in a half shiny black tone and assembled with the barrel.
The final model is visualized as a two piece cast wheel. That is because it would be the most economic way to produce it due to its concavity. It also made it possible to increase the diameter further. It does not have centerlock only for a raw motorsport look, but for drawing more attention from viewers that might not be familiar with it. It also let spectators see the shape at first sight before knowing it’s a wheel.

The fullscale model gives a good insight of the entire design, including the spokes that appeared to create an, in this case, black orb when seen from any other angle than straight up front.

Finally it was exhibited at the week-long vernissage at Kulturmagasinet in Sundsvall along with all the other graduates in 2017. It got lots of attention on its stand among all art and other products.
AFTERSHOCK

The result is four individual rims that fulfill the given demands for the project. They draw attention with extravert design language that is not seen every day. They have a slightly conceptual feeling without childish or mechanical features. But neither impossible to build by any means.

Wheels is definitely something I consider working with in the future. For every sketch being made new ideas of how the next four could look starts to evolve. That’s what made this project hard, difficult to proceed and move on with one design. A very interesting part was to see how the original sketches changed when transferred into 3D. That made it unpredictable to know which ones to go forth with.

I hope my designs will create interest within MHT and that at least one of them is produced. The project’s vision would be fulfilled when the first set reaches the public and the company benefits from my creations.