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Deconstruction and Material/Process Analysis of Existing Product

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Introduction and history

I am discussing my skateboard as it is easy to dismantle but also has enough components and materials to make it a complex product. The skateboard was originally created in the 1950's in California as a way for surfboarders to surf concrete. 'In 1970, two skateboarders in Washington DC tried an experiment. These skaters where Frank Nasworthy and bill Harward... they put on a different kind of wheel.' It has been developed throughout the years in different ways from ceramic wheels to Polly urethane wheels; the plywood boards have now been developed to have carbon fibre inserts to make them sturdier but also more light weight. These changes have been made so that using them is more efficient and easier to do.

Product type

This is a sports and recreational product aimed at anyone who wants an active hobby. It is a viable method of transport in a city environment as it is quick to get around and easy to move about. It is especially popular with younger generations as it is cheap to get into and easy to pick up the basics. The younger generation can learn tricks and stunts to occupy their time with.

Materials and production methods

<u>Part</u>	<u>Material</u>	<u>Manufacturing Process</u>
deck	plywood	Steam bending
Trucks	Steel or aluminium	Sand casting
Risers / shock absorbers	A hard plastic or dense rubber	Injection moulding
Wheels	polyurethane	Open mould casting
Grip tap	Cotton polymer, Grit, adhesive	Electrostatic bonding
Bearings	Steel or aluminium	Line production

Production method

Skateboard deck is made through a process called steam bending. Is used to shape the deck, it is a process where thin layers of wood are heated using a steam box. Because of the heat and moisture it makes the wood flexible. The layers are then places into a mould whit each

layer getting a coat of Cascamite adhesive in-between them. As the glue hardens and the wood dries the deck becomes a sturdy solid piece.

Skateboard risers/shock absorbers are made using injection moulding with ABS. injection moulding is a process where material is placed in a hopper and then slowly melted as it goes down an Archimedes' screw then it is injected into a mould

Skateboard bearings are made using pre-made rings they then measure the inner and outer diameter. They then place an inner ring into the middle of it. They then insert little steel ball-bearings into the bearing and space them and apply a cage to keep the spacing accurate.

Skateboard trucks are made using sandcasting. Sand casting is a process where a form is used to make a mould in dense sand; they make the mould in two halves and then put them on top of each other and clamp together. They then place some silicone into the mould to make the aluminium harder before they assemble the two halves of the mould and pour the molten metal

Skateboard wheels are made using polyurethane. The mix is poured into a mould that has been cut off on a CNC router after being designed on a CAD program. Then they are baked at '240°F' to remove the bubbles from within the mixture (how it's made)

Skateboard grip tape is made using Polly cotton. The material is then rolled between rollers that add an adhesive to one side of the cotton. This is then pulled into an electrostatic machine that is kept hot. They then pour the grains onto a conveyor belt. The conveyor belt then moves the grains between electrostatic plates that are pulled under the cloth. This creates a mini sandstorm that makes the grains air born and have them stick to the adhesive side. After this process is done the grip tape is inspected and then sent through an oven with three heating zones that build up the temperature and bakes the grain into the adhesive to harden it. After this, a resin is placed over the grip tape to bind the grit to it. It is then cut down to size to fit the board. (How it's made) 'There are thousands of tiny abrasive grains on each piece the idea is to create friction'

Advantages

The advantages of using these methods to using the methods are because they are simple enough to be on large batch and small batch manufacturing. The advantage to all of these processes is it will be expensive to set up but it is cheap to maintain over a long period. As they are done in batches it allows customizability but it also means they can produce it when needed so there will be no excess product.

The advantages of using the materials on this board are that they are cheap but sturdy and have a long life span. Another point is that all the materials on most boards are recyclable.

Maintenance also isn't really a problem because it has a simple construction and is made out of durable material meaning it is very hard wearing and can take a lot of punishment, any maintenance needed is usually simple or just to replace one part.

Development

Skateboards have been developed over the years so that some of the higher end boards have more unique features like titanium 3D printed trucks, carbon fibre decks or inserts for the plywood decks to make them lighter but also durable. Another development is that they went from make the ceramic wheels into polyurethane composite. They have also now got electric boards as well.

Summary

They make grip tape in this way as it is the most efficient way to mass manufacture in large quantities as it is a continuous process. They use steam bending because it is the easiest way to get the product to the shape required with the materials they use. Through the development of the product skateboards have become easier to ride allowing a wider range of people to enjoy and pick up the sport

Bibliography

<u>Creator</u>	<u>quote</u>	<u>source</u>	<u>date</u>
How it's made	'240°F'	https://www.youtube.com/watch?v=U64j80P-VIO	Apr 12, 2018
By Michael Martin	'In 1970, two skateboarders in Washington DC tried an experiment. These skaters where Frank Nasworthy and bill Harward... they put on a different kind of wheel.'	Skateboarding History: From the Backyard to the Big Time	Published in 2002
How it's made	'There are thousands of tiny abrasive grains on each piece the idea is to create friction'	https://www.youtube.com/watch?v=FpkRIFrIH8	Apr 19, 2015



Skateboard's



Skateboard wheels are made using a polyurethane. They are done in open casting where they are poured into a mould and baked to get the desired results
Skateboard trucks are made using sandcasting. They then mix some silicone into the mould to make the aluminium harder

Skateboard bearings are made using on line production using premade parts where they assemble them they have two rings that are measured to be the right size for quality checks and the smaller one is placed inside and then the ball bearings are added and spaced then a cage is added to keep the spacing accurate



Skateboard deck is made through a process called steam bending. It is where layers of plywood that have been glued together using Cascamite and are steamed in a mould and as they get more wet it will form to the mould
Skateboard grip tape is made using Polly cotton blend and grit is added to one side to create friction for the rider
Skateboard bushings are made using injection moulding with ABS

