MATERIAL BREAKDOWN

Felt base:

The felt base is made from 100% wool from different origins. The front panels, back panel, and collar are made from 100% dutch merino wool in its natural, undyed ivory and brown colors. I am located in the Netherlands, so sourcing wool from here was the most sustainable option. The beige elements seen on the left front panel are ivory dutch merino wool dyed in treebark and henna dye. The natural tannins in the treebark act as a natural mordant and allow dyeing without mordanting the wool with metals like alum. The sleeves are felted from a variety of wool leftovers sourced from prior projects, so that nothing goes to waste.

Biomaterial coating:

The Biomaterial is made from Sodium Alginate, Chitosan, Glycerin, Coconut Oil, Sun ower Oil, and Sandalwood powder.
Water, Acidic Acid, Soda Carbonate, Calcium Chloride and Tripolyphosphate Polyanion are used as solvents, pH modifiers and crosslinkers.
All the ingredients were picked to be 100% renewable and biodegradable.
As the biomaterial is still experimental and some of the ingredients are hard to come by as a student/non-enterprise they are sourced mainly according to availability, thus it can not be confirmed how sustainably the companies I bought from produce the materials.

- Biopolymers: The biopolymers form the basis of the biomaterial. Alginate and Chitosan are picked for their sustainability and compatibility. Alginate is a negatively charged bio-polymer, and Chitosan a positively charged bio-polymer. When combinded, they form a stable gel through ionic crosslinking, creating a cohesive polymer matrix that dries into a strong biomaterial
- Alginate is derived from brown seaweed, a highly renewable resource that can be sustainably farmed. I sourced the Alginate from Saporepuro.
- Chitosan is derived from Chitin, which is extracted from the shells of shrimp and other sea crustaceans, thus repurposing food waste. I sourced the Chitosan from my university Lab; the company that manufactured it is unknown to me.

- Glycerin and Oil are plasticizers, providing softness, flexibility and elasticity. The primary plasticizer is Glycerin, picked for its high efficiency in imparting flexibility and softness to the material. Vegtable Oils are added as secondary plasticizers to avoid tackiness and improve cohesion and general handfeel.
- Vegtable Glycerine is a byproduct of vegetable oil production, making it a renewable and biodegradable resource. Sourced from EQM SOLUCIONES QUIMICAS.
- Coconut Oil gives the material a Leathery hand feel. The coconut oil used is organic and fair trade to reduce environmental impacts.
- Sunflower oil is a neutral vegetable oil, compared to coconut oil, it reduces the greasiness of the biomaterial. The sunflower oil used is organic and fair trade to reduce environmental impacts.

- SandaLwood powder is used as a fiLLer, adding coLor, texture, strength, and reducing shrinkage when drying. It was picked for its unique coLor, texture and heaLth benefits. Farmed SandaLwood powder was picked to reduce the environmentaL impact. It shouLd be noted, tho, that SandaLwood powder can pose environmentaL concerns, especiaLLy when sourced from manufacturers without reguLations. Thus a different fiLLer, Like recycLed fabric fibers (see Design Documentation) is more suitabLe for Large scaLe production..
- Acidic Acid and Soda Carbonate were picked as pH modifiers due to their high efficiency in shifting pH and due to their accessibiLity. Both were sourced from a LocaL grocery store.
- CaLcium ChLoride crossLinks ALginate into a stabLe geL matrix and adds water resistance. It was sourced from OnLineChemicaLien
- TripoLyphosphate PoLyanion crossLinks Chitosan, improving stabiLity and durabiLity. It was sourced from my university Lab; the company that manufactured it is unknown.
- DemineraLized water was chosen over tap water to avoid pH and mineraL variabLes depending on Location of the water source. It was bought at a LocaL grocery store.