Donation of Old clothes and enhance its using life

-Adjustable Hanger Design

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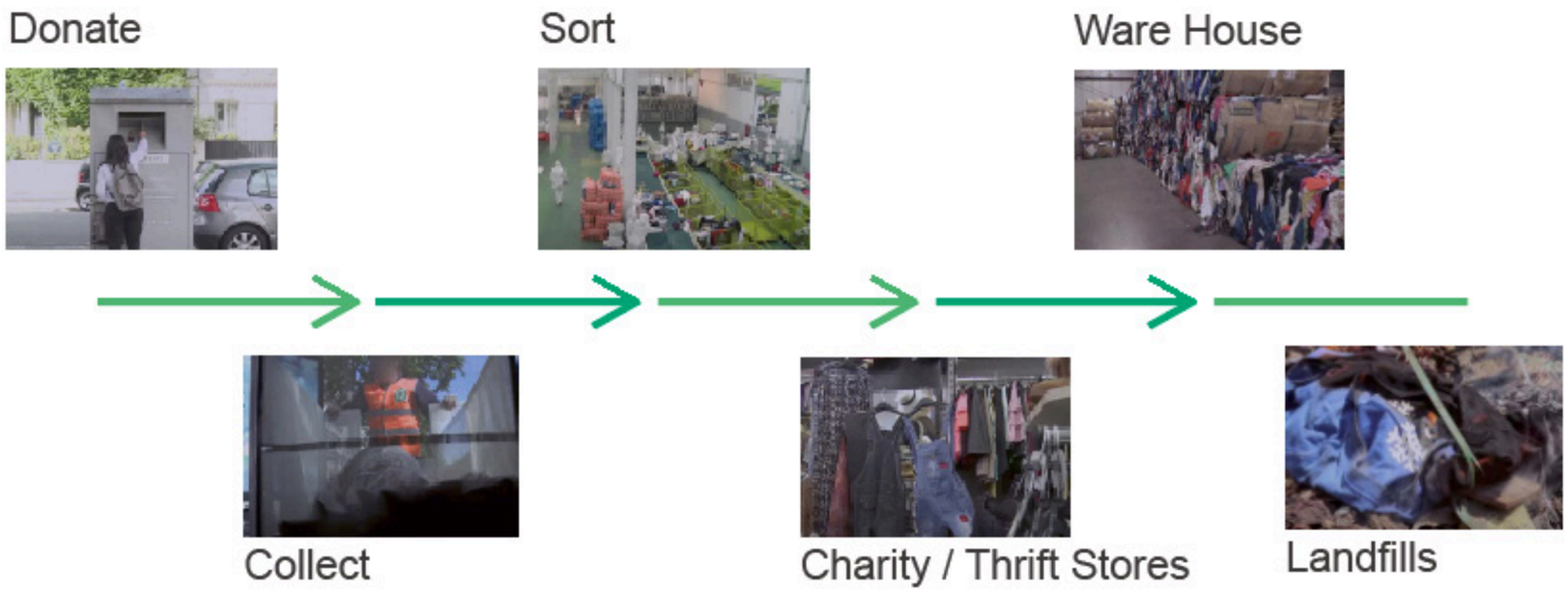
Msc Product Design Engineering
Major Design Project

THE GLASGOW SCHOOL OF ART



Background:

Fast fashion is popular, and customers are buying too much. Clothes in wardrobes update quickly. After old clothes being dumped into donation bins, it will be collected and stored. Then it will be given to people who need it or be sold in a thrift store. For what left over, the clothes no one wants and can not sell will be transport to a warehouse and finally end up in landfill or be burned.

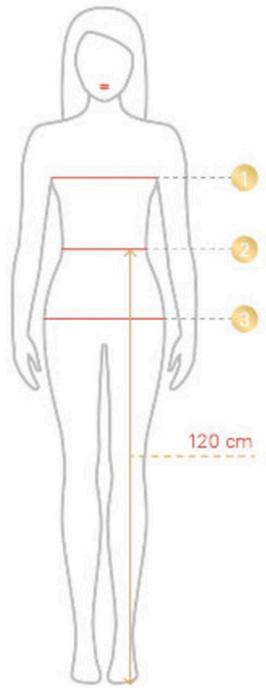
Therefore, to reduce the carbon footprint of landfilling and burning, selling old clothes in thrift stores is an important process to give old clothes a new life. During lockdown, thrift stores were forced to close for a long time, and now many of them are opening again.

Research

Fitting rooms are closed as a high touches place, and this affects customers' choice and purchase of clothes. Customers would like to try clothes on is not only aimed to see how it looks like, but also because they want to know if it fits.
However, as a result of closed fitting rooms, customers can not try those clothes on but to image whether the clothes fits or not.

Size: M showder width: 20inch


Size: M showder width: 16inch

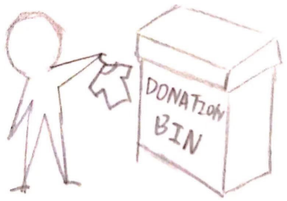


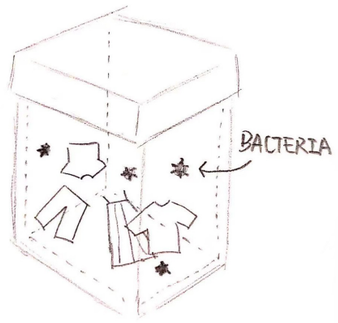
European Clothing Sizes (cm)

	EU	chest 1	waist 2	hips 3
XS	34	80	58	86
S	36	85	61	90
M	38	91	67	93
L	40	93	76	101
XL	42	99	80	104
XXL	44	107	93	112

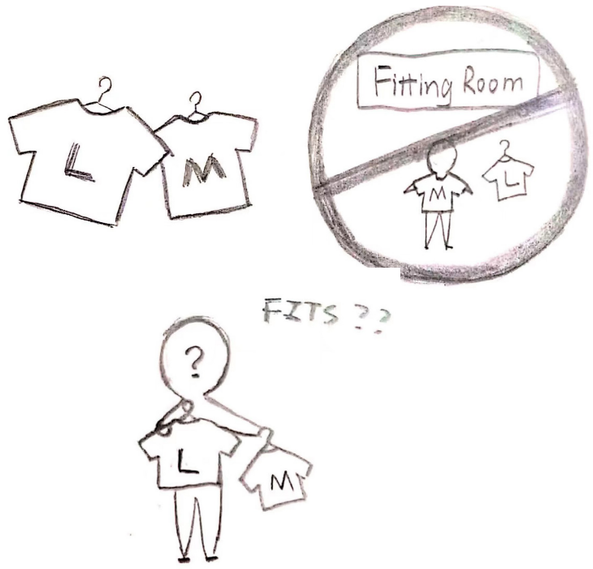
Clothes have a standard size, but human bodies do not. Additionally, size of clothes is not always accurate, some brands are tighter than others. This sometimes confused the customers, especially in a second-hand store, which clothes are from different brands.

Design opportunity:





Disinfection of second hand clothes:
Before old clothes dumped into a bin it may not be washed and carry bacteria.



When buying clothes, customers want to know how they look like in those clothes and if it fits. However, closed fitting rooms affect customers' choice and purchase.

Target users of this project:
Second hand clothes buyers, age from 15 to 50.

Stakeholders:
Retailers of thrift stores

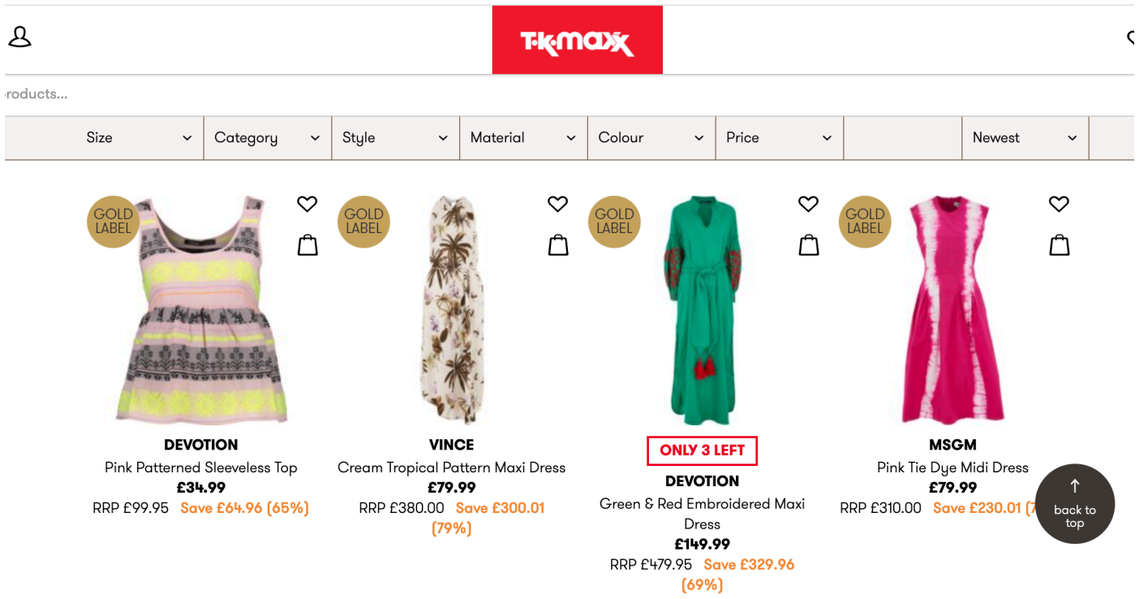
Find a better way to measure clothes and demostrate how it looks like when dressed on.

Existing solutions in market

Online Shopping

Advantages: Customers can buy clothes online and try them on at home. If the clothes are not fit, they can be returned within the prescribed time limit.

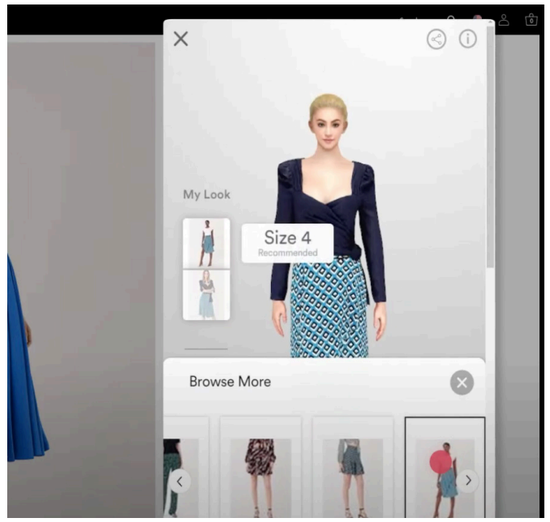
Disadvantages: Increased carbon footprint during shipping back and forth. Most deliveries use plastic packaging and excessive amount of carboard. Besides, retailers demends extra employees to sort those returned clothes,



Smart Technology

Advantages: Customers can intuitively see what a clothe looks like on themselves without actually trying it on. Then judge whether it looks good

Disadvantages: The smart technology only shows the apperance of clothes, cuatomers still do not know if the size fits.



Idea Generation

What if...

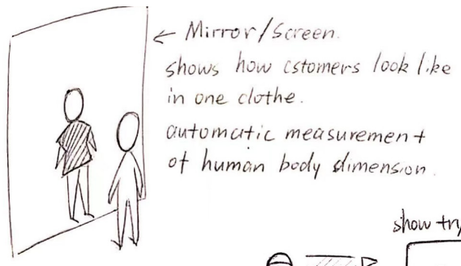
With a adjustable hanger or model, which can change its dimension to customers' body dimensions. In this way, indiiduals do not need to try clothes on and can know if the clothes fits.

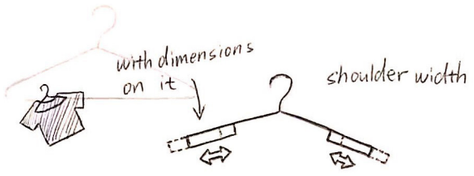
What if...

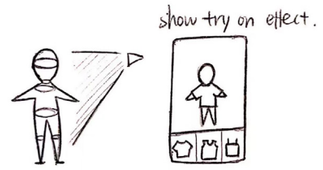
Find a new way to measure the body size, to help cuatomers who do not know their own size to confirm the sppropriate clothing size.

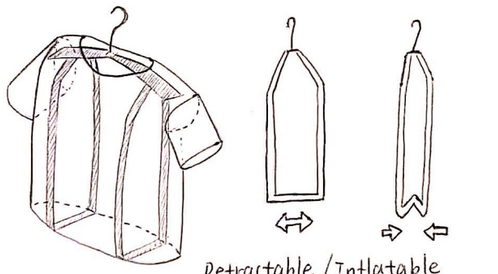
What if...

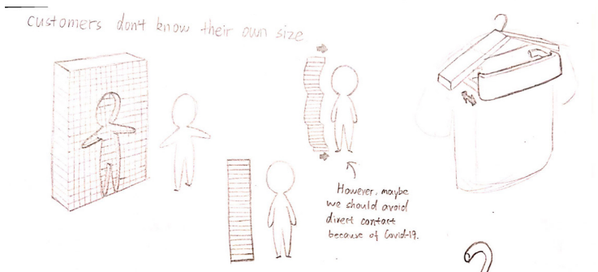
Scanning the 3D dimensions of customers' body, than display how it looks like and if the clothes fits with app.

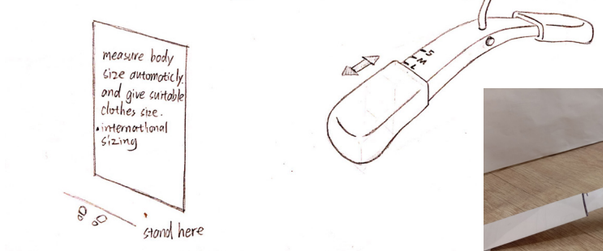


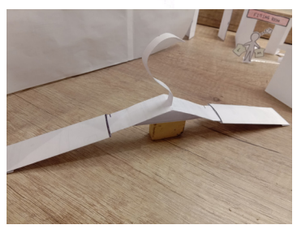


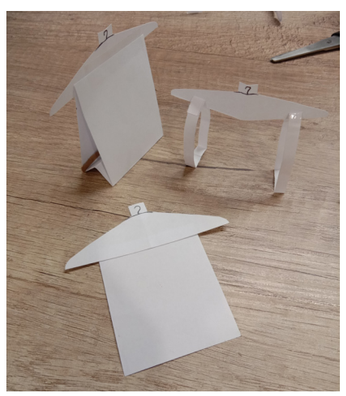












Concept Development

Adjustable shoulder width. There are scales and corrsponding clothing size marks on it.

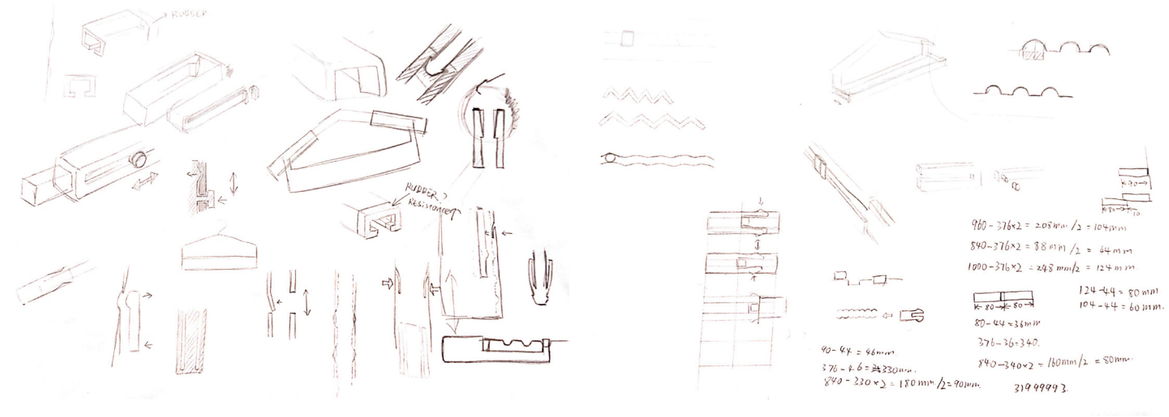
Concept Development

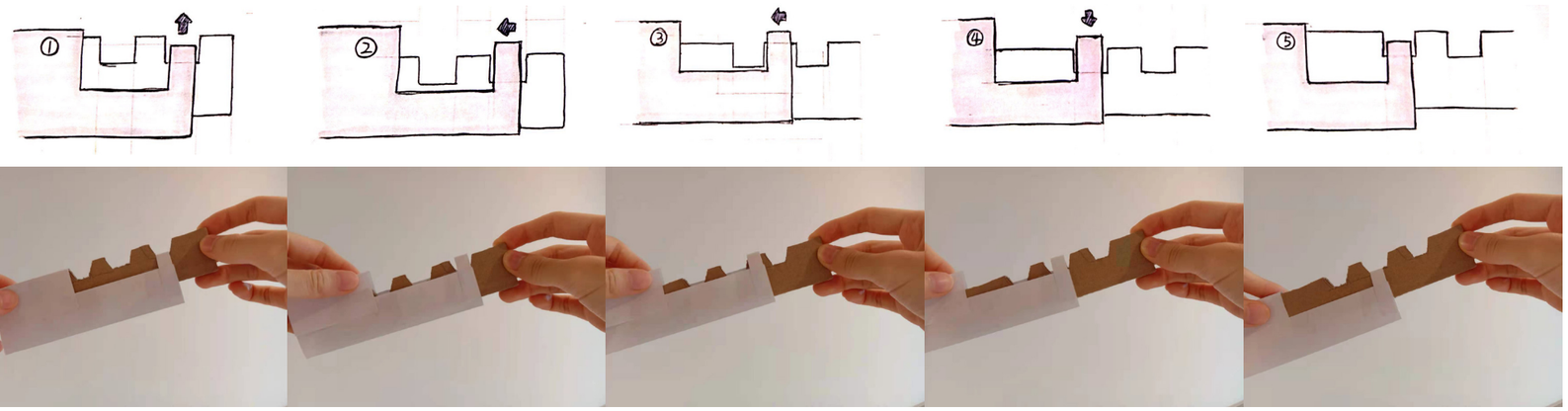
Adjustable shoulder width and bust size.

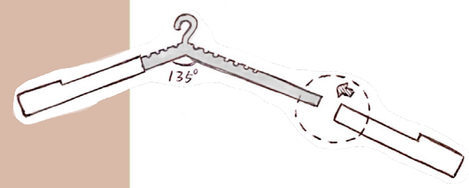
How to adjust the hanger?

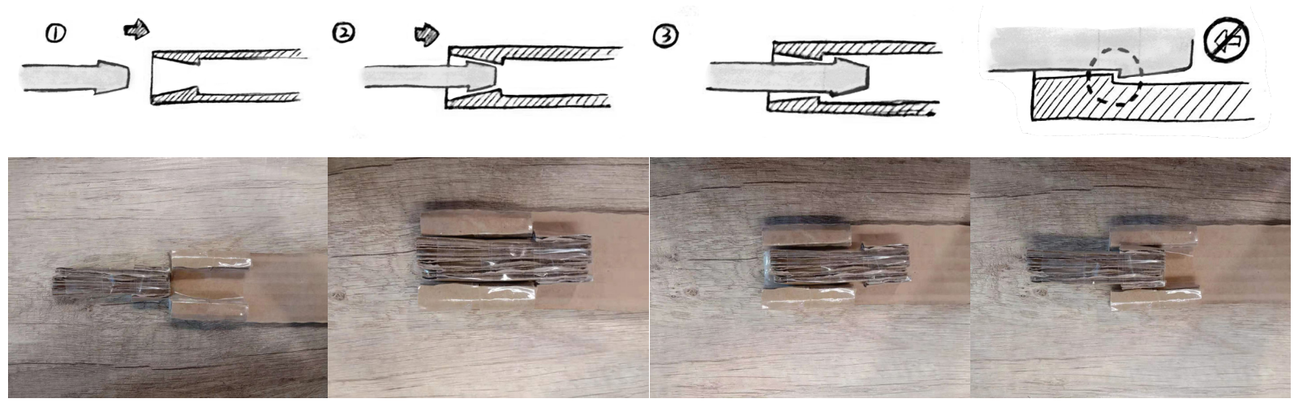
Electrical ✗ By Hand ✓

In order to make the adjusted size can be fixed accurately, shoulders of the hanger are designed with slots.

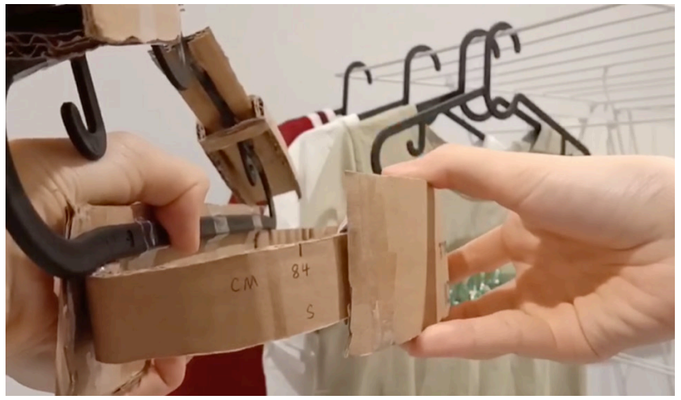








Using Journal

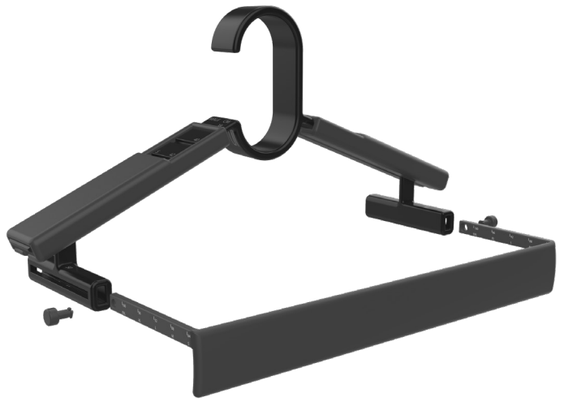


Final Product

The hanger with adjustable shoulder width and bust size. The dimension and international size is shown on the hanger. One side is for female dimension and another side is for male. Thus, individuals can adjust the hanger into their own shoulder width and bust size.
The hanger provides a 3D visualization of clothes dressed on and customers can directly see if the clothes fit their size, and decide to buy the clothes or not

Design for Assembly

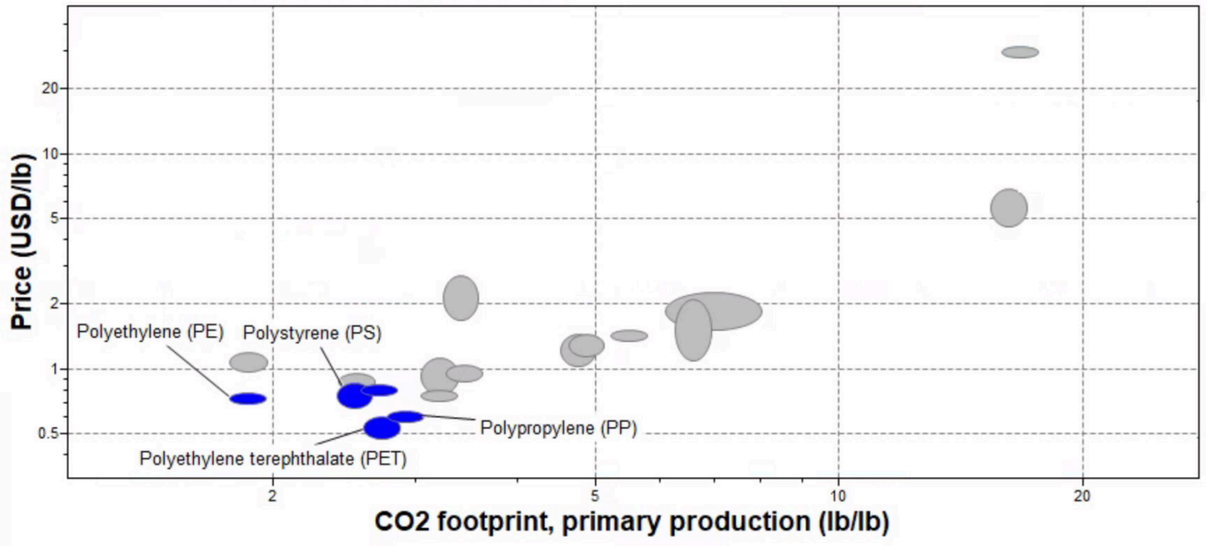
Assembly Process

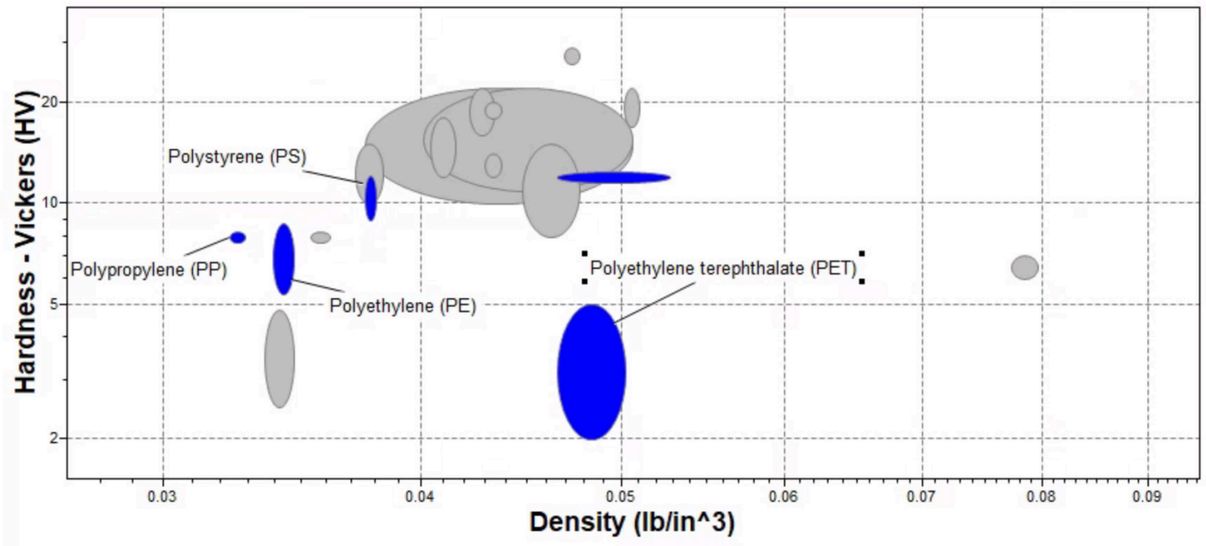


Click for assembly

Material and Manufacture

Material: Polystyrene (PS)
Manufacturing process: Injection Moulding





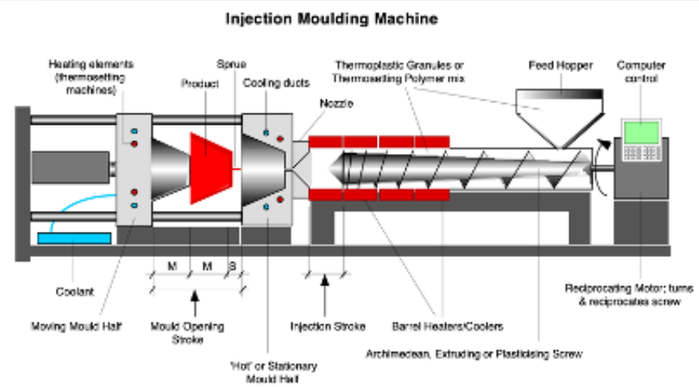
Keeping the number of different materials to a minimum can help to reduce manufacturing costs. All components of this product will be made of same material because it does not have any electronic part. In addition, the unified use of materials is also convent for disassembly and recycle.
CES material selection software was used to help selection with additional restrictions.

The two graphics illustrate hardness & density and price & CO2 footprint, and limitations are added as selection criteria.

- Minimum hardness is 5 HV.
- CO2 foot print should be no more than 3 lb.
- The material must be recyclable.

Polyethylene (PE), polypropylene (PP) and polystyrene (PS) are three ideal materials. There is little differences in price but PP produce the most carbon footprint. Additionally, both PE and PP are translucent. In order to ensure scales and clothes sizes on hanger clearly to seen, the material od hanger should be opaque. Therefore, PS is chosen to be the material of hanger.

Elongation			% strain
Hardness - Vickers	5		HV
Fatigue strength at 10^7 cycles			ksi
Fracture toughness			ksi.in^0.5
▸ Thermal properties			
▸ Electrical properties			
▸ Optical properties			
▾ Eco properties			
	Minimum	Maximum	
Embodied energy, primary production			BTU/lb
CO2 footprint, primary production	0	3	lb/lb
Recycle	✓		



Thank you