Procuring Household Robotic Prosthetics

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Problem / Question

Using met-analysis determine what is the best base material for robotic prosthesis?

Hypothesis

I believed because there would be machinery and moving parts it would be necessary to find a metal alloy to work as the base material.

Base Material Traits

Material	Average price per pound	Rigidness	Durability	Flexibility
Acrylic	$125-130	High	Low	Average
Composite Carbon Fibers	$15*	Very High	High	Very Low
Ethyl-vinyl acetates (EVAs)	$1.07*	Low	High	High
Polyethylene	$120-146	Low	High	High
Polypropylene	$72-118	Very High	Low	Low
Subortholen (HMW-HDPE)	$62-85	Low	High	High

Results

- Metal alloys were too heavy a material to be used as a body
- Metal alloys limited the reparability of the prosthetic
- Resin were first used for their light weight and easy of mold ability
- The high price materials are used primarily for Body work and not structure
- Most structural supports are a combination of materials
- Polyethylene/Polypropylene mixtures are the most used base material
- Depending on the prosthetist and their preferences the preferred base material changes

Conclusion

- Metal alloys are not appropriate for robotic prosthetics base materials
  - Melting Point
  - Weight
- Mixtures of Polyethylene/Polypropylene are the preferred base for most prosthetists
- Depending on the type of prosthetic the preferred base material changes
- Household robotic prosthetics are restricted due to the robotics aspect
- Making household robotic prosthetics will require more study into different types of base material

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