

# Use of Thermal Polyolefins to Design and Produce a Micro-size Travel Box for Storage of Personal Accessories on ATVs

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## THE PROBLEM

ATV's when exposed to heat, materials like TPO become a fire hazard. and if you got a storage box for an ATV it would usually be on the back of the ATV and it would be pretty big for carrying food, water and camping supplies but you don't want your keys, earbuds or earphones getting wet or lost inside the box



## THE SOLUTION

The solution would be to make a smaller box from TPO to hold smaller objects like keys and earbuds Etc. so they wouldn't get lost in your bigger storage container or dropped from your pockets while you are riding.



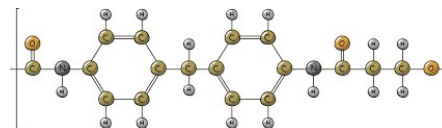
## RESEARCH PLAN

1. Research the melting point of tpo
2. understand the anatomy of the ATV
3. identify the cad software
4. identify how to plastic weld
5. get the parts to test
6. test the box

In the United States about 52 million vehicles are sold each year, and about 700,000 of those vehicles are all terrain vehicles, also known as ATV's. The key differences from cars and ATV are that ATVs are meant for recreational activities like going on trails or off roading. On the other hand, cars are meant for getting from point a to point b on road. The key components that are made from TPO on ATVs are fenders, fender flares, racing hoods, intake scoops, and side panels. I have noticed that ATVs do not have external storage units, which might impact travel experiences. This box is meant to withstand extreme weather and heat. In order to test this, I would like to understand the heat resistance of standard TPO compared to my TPO box for an ATV. and it will keep the contents of the box cool so for example your phone doesn't overheat

## EXPERIMENTAL SECTION

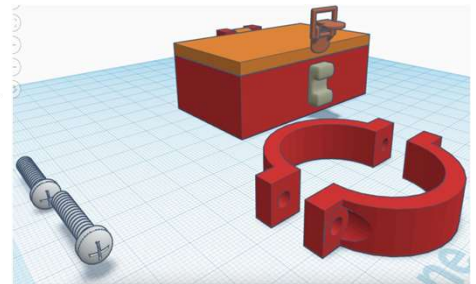
My experiment design involved coming up with a design that would work for the accessory box. I spent a lot of time thinking about the features and measures and placement of box.



**Thermoplastic Polyurethane Elastomer- Molecular Chain**

## RESULTS

The results of my design are setup to clamp box on handle-bars of ATV. Below is the first draft of my CAD file. This design is based on my observations of a ATV. The clamps are held together screws. The box is attached to the clamps using plastic welding kit. The materials is made from TPU and was 3D printed. The dimensions are 100.6mm by 100.6mm by 100.6mm by 100.6mm



## FUTURE WORK

In the future, I plan to design more TPO based accessories for the ATV. I have an interest in learning how to join materials using plastic welding and learning more about the material on ATVs that can be recycled. Additionally, I am going to look at what it will take to make the box waterproof.



**Conclusion:** This was a fun research project. I learned how to design CAD files. I also learned a lot about ATVs and how TPO material is used in so many sections of the vehicle.

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