

Engineering Design: Cargo Blanket

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Period 7





Abstract

- We are trying to make cargo accidents to happen less and accessible to everyone. We are trying to make cargo blanket to cover a lot of area as well as secure the items inside. There are thousands of people involved in these accidents every year and we trying to reduce those numbers. Trucks that are carrying material can send a brick of the truck land straight into your window. We are making to be easy to use and affordable for any vehicle.

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Introduction

- We are trying to reduce the amount of Injury caused by loose cargo. Cargos have killed more than 25,000 people every year. The cargo is not secure, or they have defected item to hold the cargo that will break. We are trying to make a Cargo Blanket that will be tightly secure on to the Vehicles and nothing can escape from the inside.

Background

- According to Safety Research and Strategies, there are an estimated 13,000 injured people annually in the United States.
- All these Injuries are caused by loose cargo either within or outside a vehicle involved in the accident.
- Sources:
 - <https://www.safetytalkideas.com/safetytalks/motor-vehicle-safety-loose-cargo/>
 - <https://journals.sagepub.com/doi/abs/10.1177/1475090213513755>
 - https://www.porttechnology.org/news/top_four_dangerous_shipping_statistics/



Material

- Here is the list of materials that are planned to be used
- Cheaper alternatives are available, but are not recommended.

	A	B	C	D	E	F	G
1	Truck Bed Cover	Name	Qty	Dimension	Function/Interaction with other parts	Cost/Price	Website
2		1 Nylon strips	12	1" x 10'	Is sewed to tarp and gives structure to it	\$18.48	https://www.walmart.com/ip/Strapworks-Heavyweight-Polypropylene-Webbing-Heavy-Duty-Poly-Strapping-for-Outdoor-DIY-Gear-Repair-1-Inch-x-10-Yards-Forest-Green/346061524?wmlspartner=wspa_selected_bellestid=101024643
3		2 Polyester Tarp		1 8.75 by 10.25 ft	It makes give the product waterproof	\$3.95/yard	https://www.fabricwarehouse.com/products/polyester-ripstop-fabric?variant=1834356264972
4		3 Stainless Steel		8 1" in diameter	Prevents Corrosion and lengthens product	\$6.80/each	https://www.lodimetals.com/?l=stainless-steel-ratchet?l=chid=CwKCAu8ABhAxEwAsodS2D173jKHDLHLEK4HhCR8-BMjGvbnVVKIcmYmPpInrN0PDRhvtHoCwYQDAvD_BuE
5		4 Aluminum Casings		4 2" by 1" in diameter	Protects the Ratchet straps	\$11.12	https://www.anger.com/product/4MMAS7gclid=CwKCAu8ABhAxEwAsodS2MEQIEK9hWwvNS-1SoephvQc9j-2to2amGvUYUxCLy5e04BhRhcOKUQAVD_BuE&cm_mmc=PPC-Google+PLA&ef_id=CwKCAu8ABhAxEwAsodS2MEQIEK9hWwvNS-1SoephvQc9j-2to2amGvUYUxCLy5e04BhRhcOKUQAVD_BuE&ved=0ahUKEwgmmbvV3bnuaHW0ZMOKH8D8CjOQjyptUA&adurl=
6		5 Ratchet Straps		4 2" by 1" in diameter	It Latches on to the Vehicles	\$6.80/each	https://www.lodimetals.com/?l=stainless-steel-ratchet?l=chid=CwKCAu8ABhAxEwAsodS2D173jKHDLHLEK4HhCR8-BMjGvbnVVKIcmYmPpInrN0PDRhvtHoCwYQDAvD_BuE
7		6 Nylon thread		3 1000m long	Is used for stitching fabrics together	\$3.99	https://www.google.com/adk?sa=1&as=DChcSevnrivbV3bnuaHW0ZMOKH8D8CjOQjyptUA&adurl=152%20x%206.25%20x%2012
8		7 Sewing Machine		1 ipches	Sews material together using thread	\$290	https://www.amazon.com/SINGER-4432-Smthase-Automatic-Stainless-1p/BDUJ6L6P7rfrasc_of_800U6L6P7rfrascprod-208linkCode=pf0&hvadid=216050490466&hpos=8hmetvng&hvrand=5188343141713402396&hpos=8hptwnc&hvgtm=8
9		8 Table saw		36.22 x 26.77 x 43.31	Cuts through material like aluminum or wo	\$199.00	https://www.amazon.com/TACKLE-2000N-Table-Aluminum-Expansion-16/80NDW4T7rfrasc_of_808NK4T7rfrascprod-308linkCode=pf0&hvadid=455987573990&hpos=8hmetvng&hvrand=157424437357257695&hpos=8hptwnc&hvgtm=8
10		9 Electric outter kit		1 unknown	Cuts through the fabric	\$4.99	https://www.google.com/shopping/product/1823887701206278357?sc=Scissors+hat+cam+cut+Hylen&sr=1-Alex450UZN06L0MMPXKAPM_XbeuZ80Kj-16117825067496&hwr=190&bih=968&prds=eto11629405381625615000_0&sa=X&ved=0ahUKEwgmmbvV3bnuaHW0ZMOKH8D8CjOQjyptUA&adurl=
11		10 Experts on chemical analysis and fabric strengths		2 N/A	To review product before customers have it Time		https://thetextileexpert.com/
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30		Conclusion Questions					
31		1. What was your the biggest challenge for your team? How do you plan to overcome these challenges?		Ratchet Straps. We will based them off of successful designs			
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34		2. While compiling these lists, did you have to determine an alternative plan for any items that you are concerned about acquiring?		No, we based our choices on readily available items			
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37		3. Do you feel your use of materials is cost effective? If not, what could you change for the designs to be more cost effective?		It is not cost effective, we need to use cheaper material			
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40		4. What steps did your team take to reassess as cost effective as possible?		We need stronger material but a cheaper alternative			
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Procedure

- 1)Unfold product onto a testing bed/ table
- 2)attach clips/ restraints to each corner of the product to maximize surface area and to test it under intended use.
- 3) remove any other material that is not originally intended to be used with product
- Testing will be intended to understand the limits of the product.
- We will be using PSI (Pressure per Square Inch) and fahrenheit for temperature
- Making sure that the Cargo Blanket^TM secure on to the vehicle.
- It can slip off and damage the property around the test.
- Set fire or heat lamps to cargo blanket near concrete.
- Make sure no animals go near the testing site.

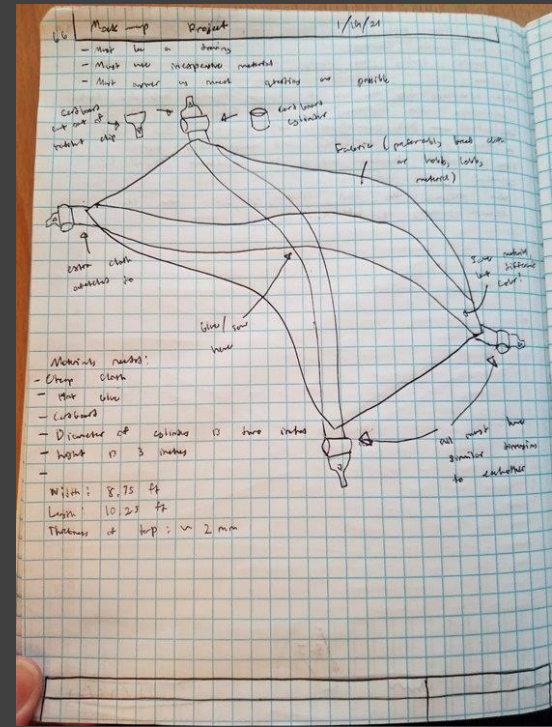
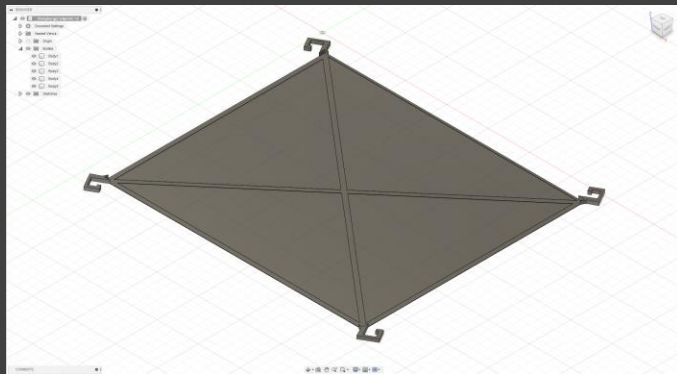
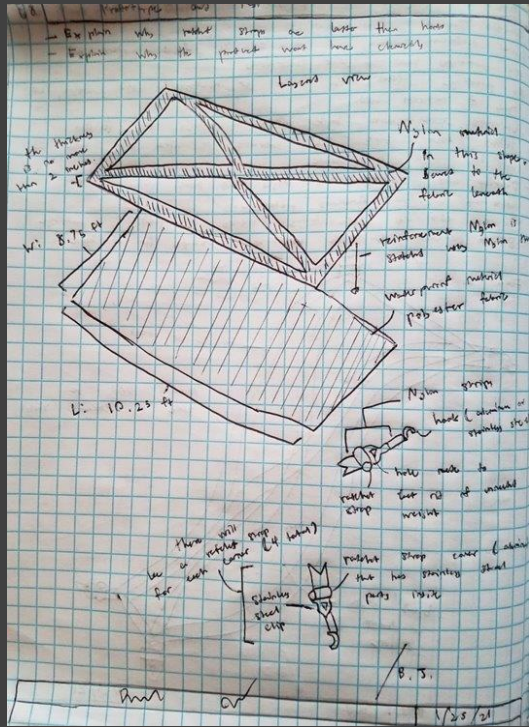


Result

- We have not tested a prototype because we do not have the proper equipment for testing.

Conclusion

- We learned how to build our own product and how to make a prototype. Thinking about how we should have tested and explored the possibility of a test. We have not tested a real prototype so we cannot give you any results. We thought of what we had to measure in the tests and how we were going to document it. We learned that we need to think realistic and do not think about something that was impossible like making 300\$ material into a 50\$ material. This what we learned during this time.



APPENDIX

Citations

- <https://www.safetytalkideas.com/safetytalks/motor-vehicle-safety-loose-cargo/>
- <https://journals.sagepub.com/doi/abs/10.1177/1475090213513755>
- https://www.porttechnology.org/news/top_four_dangerous_shipping_statistics/
- <https://patents.google.com/patent/US10800231B2/en?q=truck+bed+cover&oq=truck+bed+cover>
- <https://patents.google.com/patent/US20160368424A1/en?q=cargo+net&oq=cargo+net>
- <https://patents.justia.com/patent/7819451>
- <https://patents.justia.com/patent/6866453>
- <https://www.amazon.com/Tooluxe-50970L-Lightweight-Flexible-Compact/dp/B002GV7QOE>
- <https://www.cargogear.com/OneItemInfo.aspx?partnum=BNMINIL>