

Development of a Fiber Reinforced Polymer for Civil Infrastructure Project

Due: Thursday December 1st
at the start of class

Project

After graduation you open your own consulting company. Your first client is a manufacturer who needs you to identify a composite with the following specifications:

- Continuous, uniaxial FRP.
- A thermoset for the matrix.
- Minimum longitudinal modulus of 80 GPa.
- Minimum longitudinal tensile strength of 1500 MPa.
- Lowest cost.

You must specify the matrix material, fiber material, and fiber volume fraction. You should consider at least 3 different matrix materials and 3 different fiber materials when making your selection.

Project

Create a report that specifies the materials you considered, describes your calculations, and provides a final recommendation. Your report must include calculated values for the properties, including costs, that you used to make your recommendation. **The report is due at the start of class on Thursday 12/1.**

The content of the report should include:

- Introduction: Describe the objective of the project as laid out by your customer.
- Background: give detailed background on fiber reinforced polymers including their applications in civil infrastructure
- Calculations for each of the 3 fiber and matrix materials you considered. Be sure to include detailed explanation (text) explain all the calculations. Reference all sources of materials properties.
- Discussion: Comparison of the options based on the customer constraint. Be sure to references all sources used for cost analysis.
- Conclusion: A clear and concise statement on what combination you recommend for the customer and why
- References

Special formatting requirements:

- Be sure to paraphrase and reference all outside material. You will be uploading the report to turnitin.com to check for plagiarism.
- Reference all outside figures.
- All material, including equations, need to be typed.

- All table and figures need to be numbered, have a 1 sentence caption, and be referred to and explained in the paragraph before the figure or table.
- All equations must be explained fully in the text. Define all variables.