



**FACULTY OF MECHANICAL ENGINEERING**  
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# **MECHANICAL ENGINEERING**

## **FINAL YEAR PROJECT**

**BACHELOR OF ENGINEERING (HONS.)**  
**IN MECHANICAL ENGINEERING**

**THE ENVIRONMENTAL EFFECT ON TENSILE**  
**STRENGTH AND MODULUS OF ELASTICITY OF**  
**PP/CLOTH COMPOSITE**

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## ABSTRACT

This project is aimed to study the effect of environment on tensile strength and modulus of elasticity of PP/cloth composite. The hydrothermal effects that we choose for this project are water, salt water (NaCl with 1.5 mol viscosity) and acid hydrochloric (HCl with 1.5 mol viscosity).

PP/cloth epoxy laminates were prepared and all specimens have similar dimension (200mm X 25mm X 4mm). The water, salt water and acid hydrochloric are poured into aluminium can. Then, the specimens are immersed into them. The periods of immersion are 6 hours, 24 hours, 48 hours, 72 hours, and 120 hours. Next, data are taken and tensile tests are done immediately. The microstructures of the specimens are also studied. From the testing, the specimens are observed and the results are analyzed. For tensile test, the specimen was completely damage. From there, we plot the graphs for stress vs strain, load vs x-head, load vs extension and stiffness vs absorption. From microscopic study we found that the structure, distance and size of molecule on PP/cloth composite been expose to environment.

From the result we obtained, the highest absorption was at SN-3 (0.132 gram), the highest stress was at SW-5 (0.03001 MPa). If we compare with other specimens including specimen that had not been immersed in any environmental agent, SW-5 still has the highest stress. So from there we could conclude that as more water is absorbed in the specimen, the stresses would increase. Nevertheless, the absorption of any agent into the specimens would affect the specimen such that the stress of that specimen will decrease.

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ABSTRACT

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