CHAPTER V

CONCLUSION AND RECOMMENDATION

In this research, film-forming agents and crosslinking agents were chosen to study their effects on transparency and mechanical property of glass fiber reinforced polyester.

The most suitable film-forming agent for the laminates in this thesis was 5.0% polyester emulsion from maleic anhydride by methyl methacrylate as crosslinking agent because this conditions will produced the laminate that has highest transparency at 88% light transmission and highest flexural strength and modulus at 249.66 MPa and 9086.93 MPa. Although maleic anhydride has lower cost than fumaric acid but methyl methacrylate has higher cost than styrene. However, this conditions have appropriateness in economical using because methyl methacrylate was used a slight quantity only about 5.0% in mixing with polyester resin but it can enhance transparency and strength of the laminate.

Accelerator that mixed with polyester resin has effect to transparency of the laminates. Stable solutions of cobalt octoate in dimetyhl phthalate are possible and these are prefered because they impart less color to the laminates.

The transparency and strength of glass fiber reinforced polyester depend not only on the sizing agent but also on the unsatutrated polyester resins. The unsaturated polyester resins

should improve their properties that appropriate to produce high transparency and strength of fiberglass products by using methyl methacrylate as the one of composition from the manufacturing of polyester.

Mylar film that used as mold releasing agent in the lamination should used only two times, one face one time. Owing to the smoothly and cleanly surface and the appropriate thickness of mylar film have greatly effect to the smoothly surface and transparency of the laminate.

Suggestions :

1. The glass fibers should be produced in chopped strand mat form so that they can be distributed uniformly throughout the area of the laminates and to facilitate the lamination with the unsaturated polyester resins. Furthermore, the laminates will have equal transparency and strength throughout the products.

2. In the production of chopped strand mat fibers, the binders were used to attach chopped strand fibers in mat form. The binders may have effect to transparency and strength of glass fiber reinforced polyester product. Thus, the effect of binders and sizing agents on transparency and strength of glass fiber reinforced polyester should simultaneously study.

3. The laminates should test resistance to UV radiation. If they have high transparency but cannot resist UV radiation, they will change to yellow-colored and finally broken. The ultraviolet absorbers may added to the unsaturated polyester resins to improve this property. The discoloration can also be controlled by coating the laminates with UV-resistant lacquers based on methacrylate ester homopolymers or cladding with

poly(vinyl fluoride) or acrylic films (26).

The future of glass fiber reinforced plastics continues to look bright. The high performance of glass fibers, their ease of handling and processing into composites, their availability, and their low cost assures that they will continue to be the predominant fiber in the fiber reinforcement market. At the present time, the trends will probably be the increasing use of other reinforcing materials, such as carbon and graphite fibers. Thus, the glass fibers should be improved their properties better than now to maintain the first priority in the fiber reinforcement market. Since wetting between the interface of polymer matrix and glass fiber promotes interfacial bondings leading to the better interfacial adhesion and greater mechanical properties, the research to improve the sizing agent should study the appropriate composition and effective adhesion through chemical bonding.

Now plastics produce a big problem about their wastes. The plastics that can be recycled have the important role to solve this problem. Once cured, the thermoset material is extremely strong and stable, the material cannot be reshaped. Thus, thermoplastics have a much better trend to be fabricated as glass fibers reinforced plastics industry than the thermosets.