## SUMMARY

The research represented by this thesis deals with bisphenol-A epoxy vinyl ester resin (VEBA) composite materials reinforced with E-fiberglass fabric of medium weight (450 g/m2) and quasi-orthotropic 0-90°/±45° configuration.

The increasing use of vinyl ester resin is due to the advantageous combination of their physical, chemical and mechanical characteristics, which makes it economic and competitive in certain technological applications traditionally reserved for epoxy resins. The use of glass fiber reinforcements extends its applicability as structural material not only in the fields of chemical, industrial and marine engineering but also in civil construction.

Manufacturers of VE resin do not provide the following information: interlaminar crack strength of composites, properties of reinforcements different from mat, durability of the material until structural failure and collapse due to delamination. On the other hand, low cost manufacturing and not amortizable production infrastructure, or producing a material in situ to repair any infrastructure damages where it is not feasible to supply sufficient energy for curing composite, which is another aspect not widely established by research publications concerning the influence on the mechanical properties achieved by the composite.

The given thesis aims: to characterize the interlaminar mode II fracture behavior of the composite (VEBA/0-90º±45º)$_4$ cured at low temperature; quantify the influence of curing temperature on interlaminar mechanical characteristics; determine the mechanism of influence of curing temperature on the toughness in Mode II; establish durability of the composite during Mode II delamination in severe conditions of prolonged exposure to high temperature (95 °C) and also connections between durability and the temperature of curing.

The mechanical characterization: flexural, interlaminar shear and Mode II interlaminar fracture strengths and fractographic, calorimetric and thermogravimetric studies indicate that the composites cured at low temperatures (20 to 50 °C) have better mechanical properties than composites with mat, and very close to the 0-90º taffeta ones. The curing temperature influences the resistance against delamination and the loss of those mechanical properties by prolonged exposure to high temperature. Shear strength and interlaminar fracture toughness properties are the most sensitive mechanical characteristics. Even with low curing temperature, the resin VEBA maintains good resistance to prolonged thermal degradation.

Curing at 50 ° C makes possible low cost manufacturing and reparation in situ.