

Thesis evaluation report

Name of student: Ayanda Mavuso

Title of thesis: Characterization of woven fabric composites

1. Theoretical and professional level of work, the solved problems

The level of work is excellent. The thesis explores the properties of composites made from glass fabrics with flyash nanoparticles. In this work effort is made to use fly ash nano-particles to some properties of woven glass/epoxy composites. The properties studied include; flexural strength, stab resistance, electrical resistance, dynamic mechanical analysis, EMI shielding efficiency and UV-transmission. Results show that the addition of filler particles improves some properties, some properties are depreciated. As a result, the amount of filler and the type of filler to be added entirely depends on the final application of the composite. This means that before any composite material is produced, its intended application must be well understood so as to know which properties are of importance and which can be compromised. The weaving of 3D glass fabrics is done and it is used to make composites for structural applications. This work is very good to open ways for future research in fibre reinforced composites. Some properties like thermal conductivity, electrical conductivity have improved by use of nanoparticles.

2. Work performance, suitability of solution procedure, the formal level

The methodology used is appropriate to this work and the results have been evaluated using scientific instruments and techniques. The student has attempted to evaluate many functional properties as knife resistance, thermal, electrical, electromagnetic and UV protection etc.

3. Accuracy of results, evaluation of findings

The results are accurate and properly presented in the form of tables, graphs etc. More statistical analysis could improve the quality of this thesis.

4. Advantages and benefits for practical applications

Textile Reinforcements in composites play a pivotal role in providing the strength and stiffness requirements for aircraft and automobile parts made out of them. The composites'

industry, today, have reaped all the possible benefits from these reinforcements (Especially the Uni-directional, Bi-Directional and the multi-axial) & to that extent have reached a saturation stage in terms of their utility and performance . But then the requirement just increases and today, they are looking for a paradigm shift in that. One prospective candidate that holds great promise befitting the above required change are the 3D reinforcements. Research studies in this arena are evaluating this technology in its varied forms. These 3D reinforcements are expected to finely balance the in-plane with the out-of-plane properties and address several other issues such as delamination, impact damage tolerance etc.

5. Any deficiencies, errors

Some spelling mistakes could be avoided and explanations could be made with help of more microscopic images of the composite structure showing dispersion of nanoparticles in the resin.

6. General assessment: Excellent



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