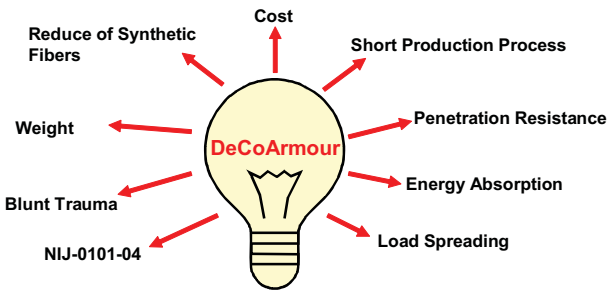
DECO ARMOUR

ABSTRACT

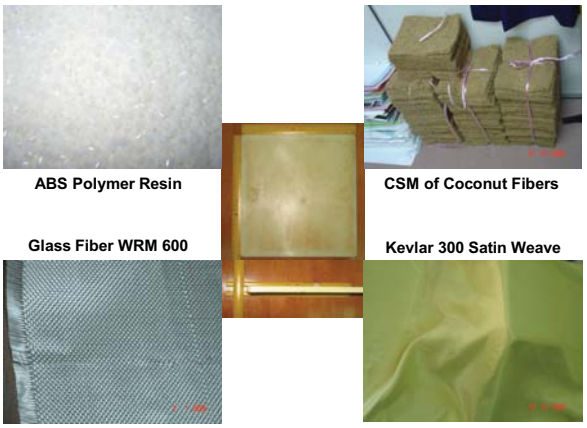
Most ballistic products use synthetic material such as Kevlar for reinforcement. As Kevlar is petroleum based, its cost is very much dependent on world market price. It is envisaged that natural materials to replace Kevlar can contribute to the drop in cost of ballistic products. Waste bio-organic materials as a filler in matrix materials to be made into hybrid composites have emerged as an alternative. One such material is coconut fiber in the form of chopped strand mat to be used as a filler, sandwiched between Kevlar and woven roving fiber glass. ABS resin from thermoplastic polymer was used as the matrix material. By using hydraulic hot press, the hybrid plastic composite is produced in panels with size 10 x 12 inches and thickness range between 14 to 16 millimeters with controlled weight not more than 1.5 kilograms. The higher filler in the composite reached 45.67 %wt. The higher value for tensile force, hardness and pendulum impact test are 24.83 kN, 81.2 and 210.783 Joule respectively, with specimens shown pullout, peel off, delamination and slip condition on failure specimens. The ballistic test is NIJ standard-0101.04 to meet Type one requirement. However, the panel tested using projectile 9 mm FMJ and using weapon of 9 mm SMG Sterling Gun for level IIA. The ballistic test show, all the hybrid composite panels behave different from ceramic panel. The raw material cost for the panel is very depended and influenced by number of Kevlar layer in the composite.

PROBLEM STATEMENT

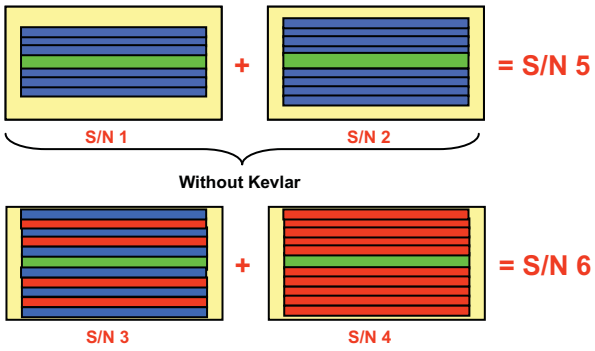


Current: 100% Kevlar, Twaron, Dyeema & Zylon, Metal, Ceramic, Nano Tubes

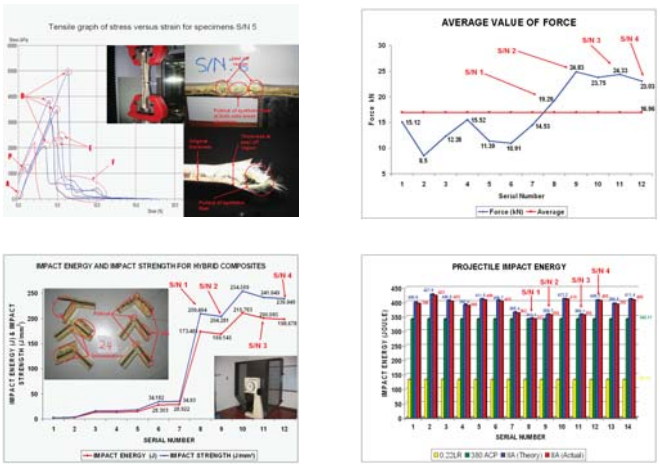
RAW MATERIALS



THE HYBRID COMPOSITE



THE HYBRID COMPOSITE



Researchers Info

Prof. Dr. Md. Dan Md. Palil
Mohd Yuhazri Yaakob

Tel : +6(06)-233 2610
Fax : +6(06)-233 2414
E-mail : drdan@utem.edu.my

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