

ABSTRACT

The main typical shin guard components are the shell and foam liner. Back to basic, the use of foam at the guard is to absorb outer energy while the shell is to resist any force such as impact from hurting the user. Nowadays however, the manufacturing of the product needs raw material that meet the specification such as stiff, safe to use, and easy to fabricate. In this project, thermoset; epoxy resin with hardener is used as matrix with Coconut Endorcarps Powder (CE-P) as it additive and thermoplastic; polycarbonates as matrix with Coconut Endorcarps Ashes (CE-A) is used to be studied so that a final product based on this material can be fabricated. Full scale prototype was fabricated based on the matrix evaluation technique due to the different PMC. As for this, prototype built was based on thermoset with CE-P. From the test have been done, (for selected thermoset with CE-P), reading show as 77.67 and 77.83 value for hardness, 0.19731 kN average break force and 1.77 Joule to resist before failure. As to compare with thermoplastic with CE-A, the reading is much ambiguous as follow 77.33 and 79.33 for hardness value, 0.05506 kN average break force for bending test and 0.06 Joule to resist before failure. With respect to research have been done, It founds that this PMC was not much adequate to withstand a substantial blow to the leg from non-ballistic weapons or flying debris. This is based on the comparative table gained from standard from European Parliament.

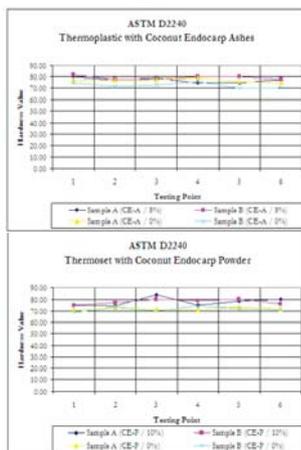
FIELD OF INVENTION

The present invention relates to shin guard for sport player shin protection and contact sports; and more particularly to a strong, lightweight shin guard system that provides increased protection to the wearer, and decreases force applied against other players during contact and other impact events.

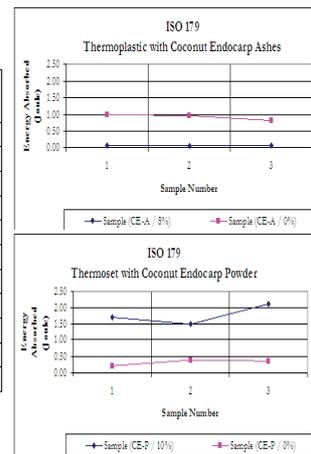
DISCRIPTION & SUMMARY OF INVENTION



ANALYSIS



	Break Force (kN)	Break Stress (MPa)	MOR (GPa)
Thermoset			
Sample A (CE-P / 10%)	0.21259	119.5840	60GPa
Sample B (CE-P / 10%)	0.17150	96.4688	48GPa
Sample C (CE-P / 10%)	0.20783	102.4278	58GPa
Thermoplastic			
Sample A (CE-A / 8%)	0.06293	35.3953	18GPa
Sample B (CE-A / 8%)	0.04583	25.7801	13GPa
Sample C (CE-A / 8%)	0.05642	31.7605	16GPa
Sample A (CE-A / 0%)	0.06492	18.2593	18GPa
Sample B (CE-A / 0%)	0.06098	17.1519	17GPa
Sample C (CE-A / 0%)	0.07975	22.4288	22GPa



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THE PRODUCT

