

The natural 'coating' for a stronger outfit

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Coated fabrics have been used in many applications such as agriculture, geotextiles, building and construction, medical, filtration and protective clothing. Coating of fabrics involves applying viscous liquid on the surface of the substrate before undergoing drying or curing process.

In a study conducted at University Teknologi MARA, Malaysia, researchers prepared a report on the tensile and tearing strength of natural rubber latex (NRL) high strength coated fabrics. 29 Plain woven Kevlar fabrics were coated with pre-vulcanised NRL using single-dip(SD), double-dip(DD) and triple-dip(TD) coating methods.

Both the tensile and tearing strength tests were done according to American Standard for Testing and Material (ASTM) using Testometric Tensile Tester and observations were made on their modes of failure.

In addition, a Field Emission Scanning Electron Microscopy (FESEM) was also done in order to observe the bonding between fibre and NRL. The NRL coated fabrics showed higher tensile and tearing strength in comparison with the uncoated fabrics.

The tensile strength for the SD-, DD- and TD-coated fabrics were 12%, 8% and 10% higher than the uncoated fabrics respectively. Similarly, the tearing strength for SD-, DD- and TD-coated fabrics were 9%, 12% and 18% higher than the uncoated fabric.

Overall, it was shown that the tensile and tearing strength of NRL coated fabrics was higher than uncoated fabric. A follow-up study was done

using unidirectional fabrics, nano fillers and fabric stitching under the same group and reported that NRL coated fabrics still gives higher puncture resistance in comparisons with uncoated fabrics.

There were significant differences between the uncoated and NRL coated fabric. After each coating, the fabric's real density and thickness increased. The NRL film on the fabric surface restricts the yarn's freedom of movement under loading.

The [energy absorption](#) and elongation of the NRL coated fabric also increases as NRL layer helps absorbs the energy and increases the strength values before the fabric completely fails by breaking or tearing. It also assists the yarns to bunch together and resist the propagation of tear or break by sharing the load with a greater number of yarns before the fabric is completely failed.

Additionally, this research found that coating with NRL increase the energy absorption and the elasticity characteristics of the coated fabrics and prevents severe damage during loading. Therefore, the use of NRL as a coating element combined with high strength woven fabric such as Kevlar improves the fabric tensile and tearing strength.

In the future, the use of synthetic rubber may replace NRL to maximize the apprehension of coated fabric for ballistic impact penetration resistance.

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