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Abstract title

| Computational modelling of woven fabrics subjected to ballistic impact |
Fabrics made from high-performance fibres such as Kevlar and Dyneema posses high flexibility, high strength-to-weight ratio, and outstanding energy absorption capacity for offering protection against ballistic impact. Among the various mechanisms influencing the impact resistance of textiles, fabric structure has been identified as one of the major factors capable of significantly influencing the mechanical performance and energy absorption of woven fabrics. This study aims at investigating the effect of fabric structures towards its ballistic resistance through computational modelling in meso-scale. Material models of aramid yarns (Kevlar 29) were constructed using mechanical properties obtained through experiments. Fabric models of four different woven structures: Plain, Satin, Twill, and Basket were then created in FE modelling package. Simulation results focusing on impact energy absorption and failure mechanism were then analyzed, in order to provide detail comparison in impact resistance between the four woven fabric structures.
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