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# Effects of woven fabric structure on the ballistic impact performance for seamless women soft body armour design

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## Résumé

The performances of a ballistic performance of soft body armour depend not only from individual material properties but also various intrinsic and extrinsic parameters. This paper tried to investigate the effect fabric construction type and impact positions for the developments women soft body armour. Two-dimensional (2D) plain weave and three-dimensional (3D) warp interlock p-aramid fabrics were selected for the study. The 2D plain weave was delivered from Teijin Company whereas, the 3D warp interlock p-aramid fabrics were design and manufactured in the GEMTEX laboratory. Different targets made of 2D plain weave and 3D warp interlock p-aramid fabrics were arranged. Each target was moulded at two points using an adapted bust-shape punch to resemble the frontal women upper torso. The ballistic tests were carried out according to NIJ standard–0101.06 - Level IIIA. The trauma depth and diameter were used to determine the ballistic performances of the panel target. Based on the result, woven construction type and number of fabric in the panel shows a great effect on the ballistic impact penetration. Moreover, 3D warp interlock fabrics show better shaping behaviour to resemble the frontal women body with less defect.

**Mots-Clés:** Woven fabric structure, Ballistic performance testing, Para, aramid fibres, seamless women ballistic vest.

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