

Innovation in Fragment Protection – High-Performance Knits made with Dyneema®

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Abstract. Fragmentation wounds of high-energy Improvised Explosive Device (IED) blasts are one of the major causes of injury in modern warfare. The destructive blast forces of the IED simultaneously affect the ballistically unprotected body regions with potentially life-threatening end results. This study provides a systematic overview on the research and development for knitted textile solutions made of UHMWPE fibres, branded as Dyneema® providing protection against the IED threat forces. The R&D work combines computer simulations, textile development, physical testing of ballistic retardation properties as well as textile comfort properties. The resulting fragment protective knits are developed to serve the need for armouring against secondary fragmentation wounding. The knit typical characteristics support the overall comfort while enabling integration into PPE systems at currently unprotected areas.