

HiPerDuCT Programme Grant

Final report: Micro-wrapped Hybrid Tows

Dry fibre tows consisting of high modulus fibres micro-wrapped with high strain-to-failure fibres have been developed as potential candidates for improving ductility in high performance composites (figure 1). These dry textile architectures have the potential to offer significantly lower-cost ductility solution in comparison to thin-ply prepreg-based laminates.

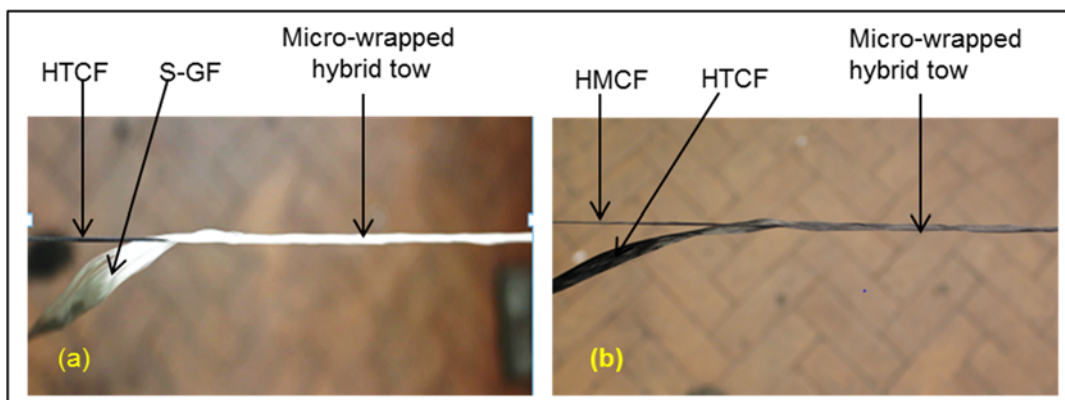


Figure 1: a) micro-wrapping T700 carbon fibres with S glass fibres b) M55J fibres with T700 carbon fibres

Uni-directional (UD) woven fabric (figure 2a) laminates consisting of micro-wrapped tows have been compared with conventional hybrid laminates (with side-by-side configuration). While conventional hybrids exhibited a significant load-drop after the first failure, micro-wrapped laminates exhibited pseudo-ductility through stable fibre fragmentation/ pull-out (figure 2b).

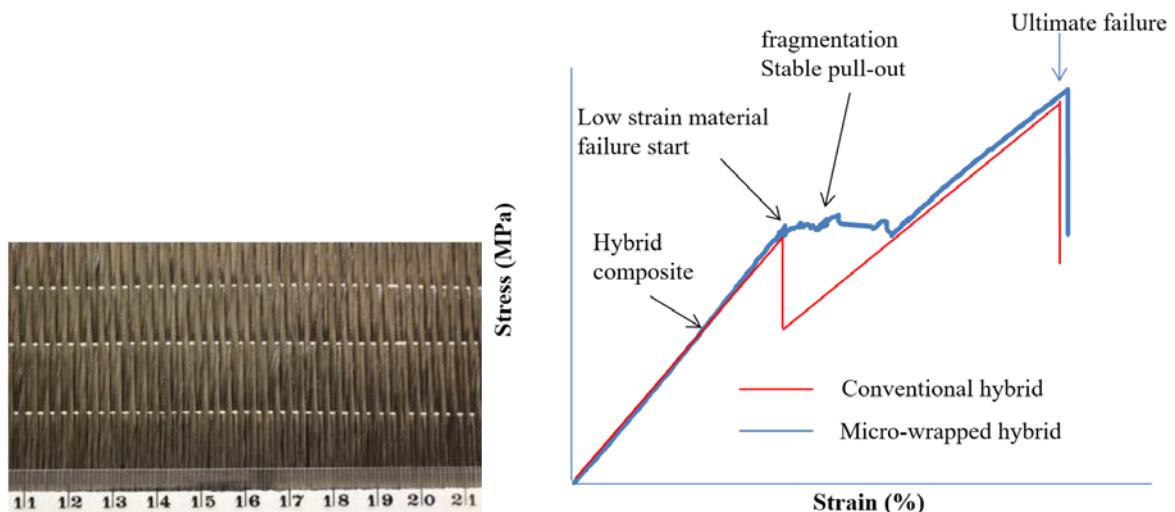


Figure 2: a) Uni-directional weave micro-wrapped fabric b) micro-wrapped versus conventional side-by-side hybrid

Reference

Islam MH, Koncherry V, Wisnom MR, Potluri P, Pseudo-ductile Composites with Micro-wrapped Hybrid Tow, ASC 33rd Annual Technical Conference, September 24-26, 2018, Seattle, USA.