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CRASHWORTHY PERFORMANCE OF BOMBYX MORI GLASS FIBRE/EPOXY HYBRID CYLINDRICAL COMPOSITE TUBES: EXPERIMENTAL

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This study investigated the failure behaviour, energy absorption response and loads carrying capability of glass fibre (GF)/*Bombyx mori (B.mori)*/epoxy hybrid composite cylindrical tubes subjected to an axial quasi-static compression test. The reinforced cylindrical composite tubes were prepared using mandrel assisted hand lay-up technique. The specimen tested were three glass fibre cylindrical tube, each consisting of five layers of (GF), three *B.mori* fibre cylindrical tubes, each consisting of 15 layers *B.mori* fibre and GF/*B.mori*/epoxy hybrid cylindrical tubes, each consisting of three layers of GF, nine layers of *B.mori* fibres. The height of each tube was 50 mm tall, the thickness was 10 mm and the diameter was 65 mm respectively. The energy absorption and load carrying ability of the tubes were analyzed by measuring specific energy absorption, maximum peak load (P_{max}) and total energy absorption (TE) as a function of diverse fibre behaviour under compressive loading. Failure mechanism of the tubes was analyzed from high resolution photographs obtained during test. As expected, GF/*B.mori*/epoxy hybrid tubes performed better in load carriability and energy attenuation, while *B.mori* tubes performed better in progressive crushing failure behaviour. Deformation morphology suggests micro to macro cracks, tear propagation, delamination and collapse.

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