

Crushing behaviour of plain weave composite hexagonal cellular structure

ABSTRACT

The tradition of fibre composite materials in energy absorbing tube applications has gained interest in structural collisions in the composite materials industry. Thus, the subject of this work is the experimental investigation to understand the effects of the failure initiator at the specimen's edge, causing the increase in the specific absorbed energy (SEA), as well as the influence of the cellular structure composed of cells with small hexagonal angle exhibited high energy absorption capability. An extensive experimental investigation of an in plane crashing behavior of the composite hexagonal cellular structure between platen has been carried out. The cellular structure composed of hexagonal cells with angles varying between 45 and 60°. The materials used to accomplish the study are the plain weave E-glass fabric as a reinforcement and the epoxy resin system as a matrix. Furthermore, the specific energy absorption increases as the hexagonal angle increases.

Keyword: Composite; Crushing behavior; Hexagonal cellular structure; Plain weave