

## **Composite materials - laminates**

- a. The overall performance characteristics of the laminate shall be predicted using laminated plate theory.
- b. Test coupons made with the proposed raw materials shall be evaluated to establish and verify the actual properties for a given lay-up or joint design before it can be used to manufacture a part.
- c. The analysis shall be verified by comparing multi-directional test data obtained with the behaviour predicted by theoretical models.

NOTE Material properties for unidirectional composite materials under room temperature and standard conditions can be obtained from material suppliers.

- d. The designer shall analyse the change of the properties of the laminate throughout its life cycle at each critical point.

NOTE Environmental effects can degrade mechanical properties to varying degrees, depending on the fibre-resin system.

- e. Composite materials shall be characterized by elementary tests on samples.
- f. Except for near net shape manufacturing techniques, the production laminate shall be fabricated to a greater size than the final one, then cut down to the proper size, and the excess pieces be used for quality control testing.

NOTE Example of near net shape manufacturing techniques is RTM “Resin Transfer Moulding”.