

Skin Stringer Separation — Experimental Failure Modes

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Summary

The application of composite materials for postbuckling blade-stiffened structures requires capturing the damage which is more critical in the rigid regions of the stringer-skin interfaces of the panel. In this respect delamination is particularly critical in the interface of the skin and stringer. In the present experimental investigation, narrow strips consisting of a skin and single stringer were cut from a large stiffened panel to form T-sections and L-sections. These sections were loaded until failure in such a way as to produce symmetric and asymmetric displacements (see Fig. 1), which are typical of the skin-stringer interfaces in a postbuckling panel. Different failure modes (see Figs. 2 & 3) were observed and the first-failure energy was dependent on the failure modes.

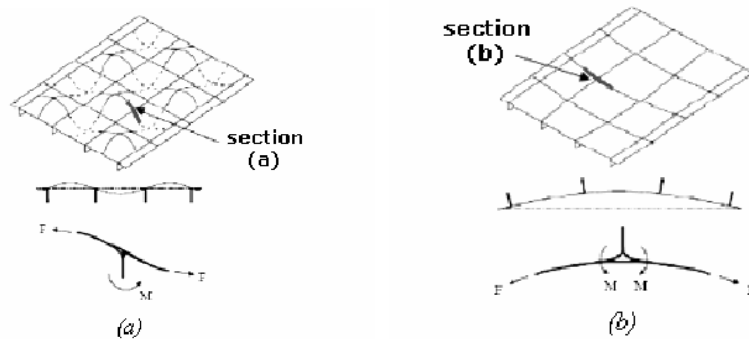


Figure 1: Postbuckling deformation patterns (a) Antisymmetric (b) Symmetric

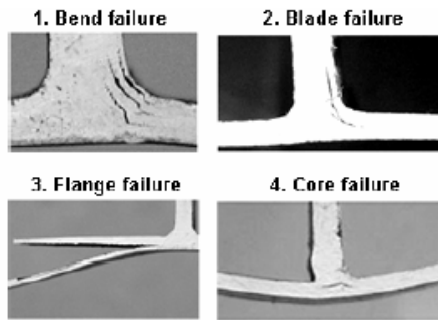


Figure 2: Failure mode classification

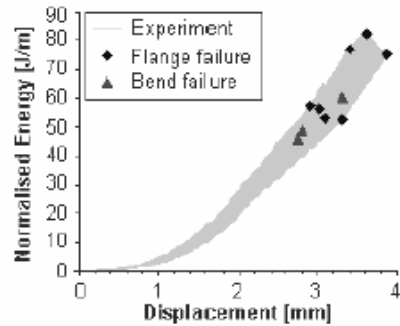


Figure 3: Pull tests, data range and failure points

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