
2.0> Composites Failure Criteria (“flatplate_res”)

This example introduces the capabilities of the MSC/PATRAN LAMINATE MODELER for conducting composites failure analyses. This can be used regardless of whether or not the MSC/PATRAN LAMINATE MODELER has been used to define the composites model. The analysis is also independent of the analysis code used.

- 1 Open the existing database flatplate.db.
 - File Open...
 - Existing Database Name : flatplate.db
 - Ok
- 2 Open the LAMINATE MODELER tool.
 - Tools LAMINATE MODELER...
 - New Layup File...
 - Layup File Name : flatplate.Layup
 - Ok
 - Create LM_Results Failure Calc
 - Select Loadcase : Default
 - Select Subcase : Static Subcase
 - Select Layered Result : Stress Tensor
 - Select Area : Elm 1:64
 - Criterion : Maximum
 - Material Allowables...
 - Ok (accept default values)
 - Name : maximum
 - Apply
- 3 View Failure Results
 - Results
 - Advanced
 - Select Result Cases : Default, Static Subcase

- Select Result : LM_Marg_Saf (Margin of Safety)
 - Type & Components...
 - Display Result As : Scalar
 - Ok
 - Plot Type : Fringe Plot
 - Plot Type Options...
 - Averaging Domain : Individual
 - Apply
 - Cancel
- 4 View Critical Ply and Critical Component Results using above method.
 - 5 Examine detailed failure results in the file : flatplate.lm_results_maximum.
 - 6 Compare with NASTRAN failure indices in the file flatplate.f06.
 - 7 Repeat the above with other criteria, e.g. Tsai-Wu.
 - 8 Close the LAMINATE MODELER tool.
 - Close
 - Cancel
 - 9 Try modifying the model to improve the strength considerably (hint: add some plies in the 45 degree direction).

If your have difficulty with this exercise, examine or play the session file flatplate_res.ses.