

EML 4230 Introduction to Composite Materials

Chapter 5 Design and Analysis of a Laminate **The Drive Shaft Problem**

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Courtesy of the Textbook

[Mechanics of Composite Materials by Kaw](#)



Sandwich Composites

Figure 5.4 goes here

FIGURE 5.4

Fiberglass facings with a Nomex7 honeycomb core. (Picture Courtesy of M.C. Gill Corporation, <http://www.mcgillcorp.com>)

Interlaminar Stresses

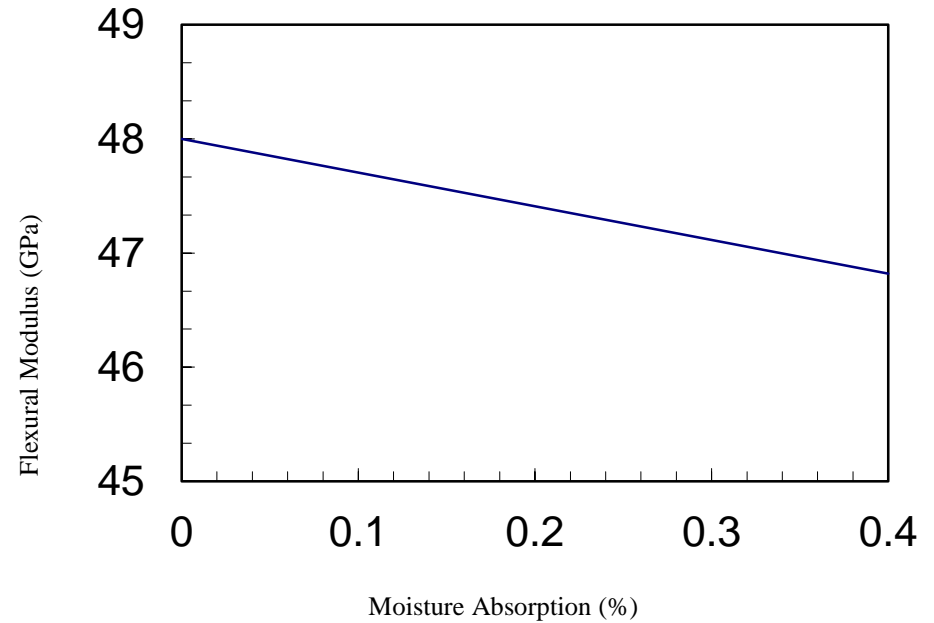
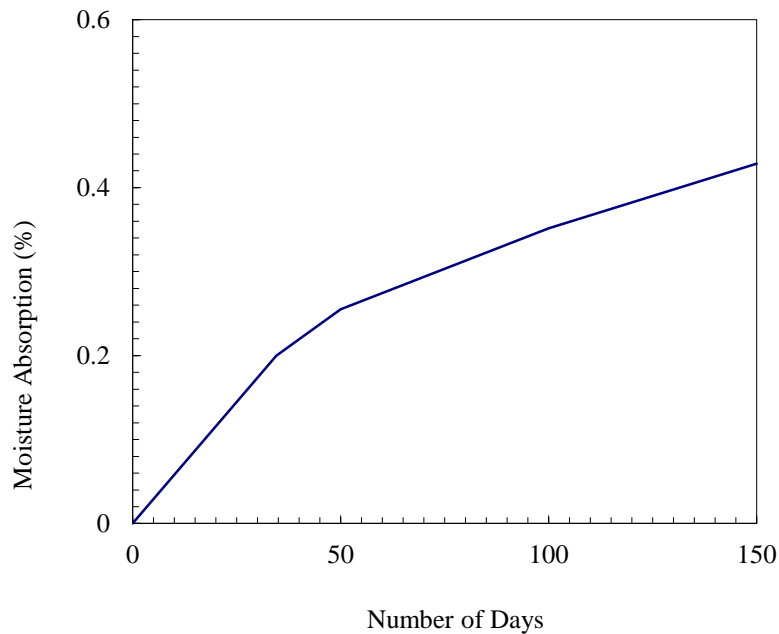


FIGURE 5.5

Moisture absorption as a function of time and its effect on flexural modulus of a glass/polyester composite rod. (Reprinted from Quinn, J. A., in *Design with Advanced Composite Materials*, Phillips, L.N., Ed., 1990, Figure 3.10 (p.91) and Figure 3.11 (p.92), Springer-Verlag, Heidelberg.)

Impact Resistance

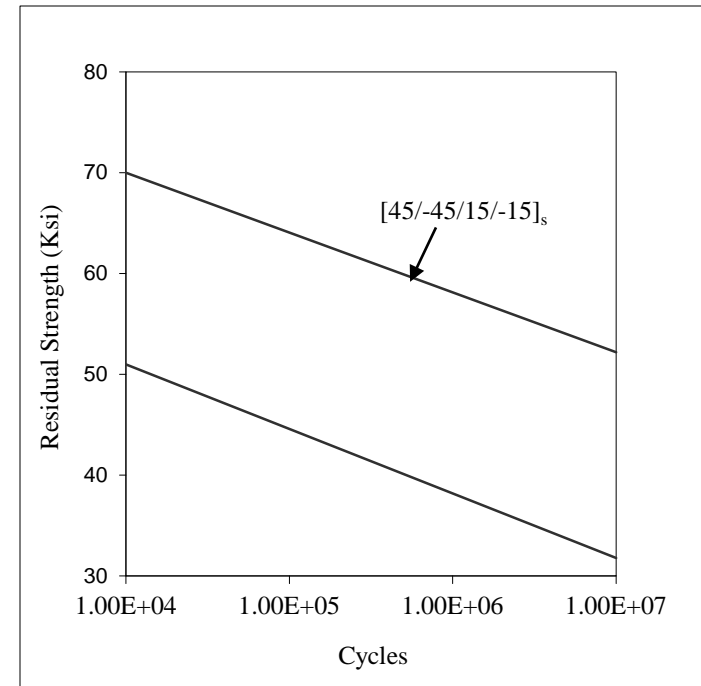
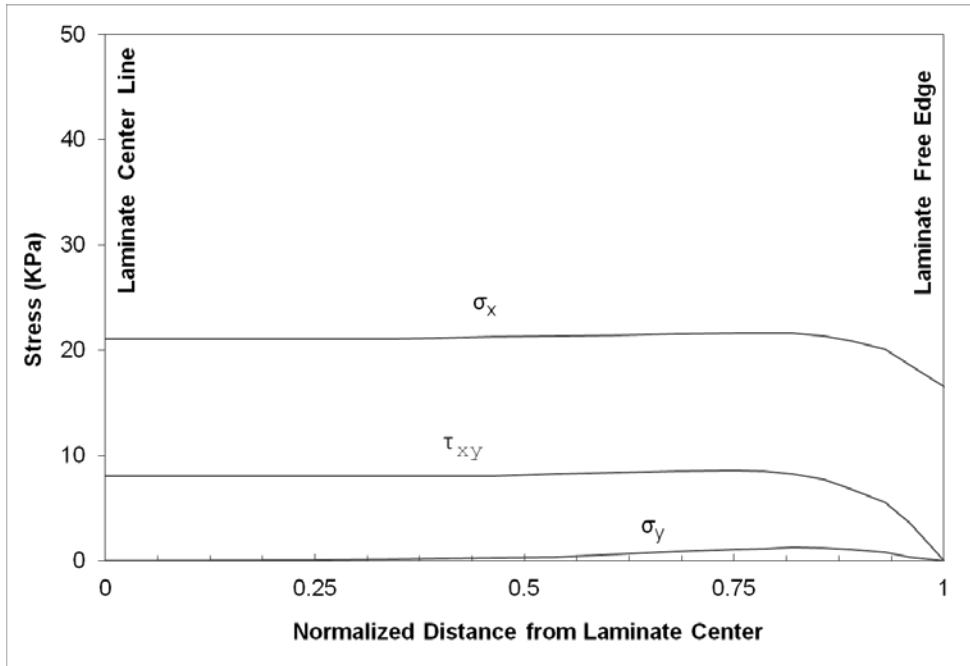


FIGURE 5.6

Normal and shear stresses at the interface of bottom surface of top ply in a four-ply laminate. (Reprinted from Pagano, N.J. and Soni, S.R., in *Interlaminar Response of Composite Materials*, Pagano, N.J., Ed., 1989, p.9, Elsevier Science, New York, with kind permission from authors.)

Fatigue Resistance

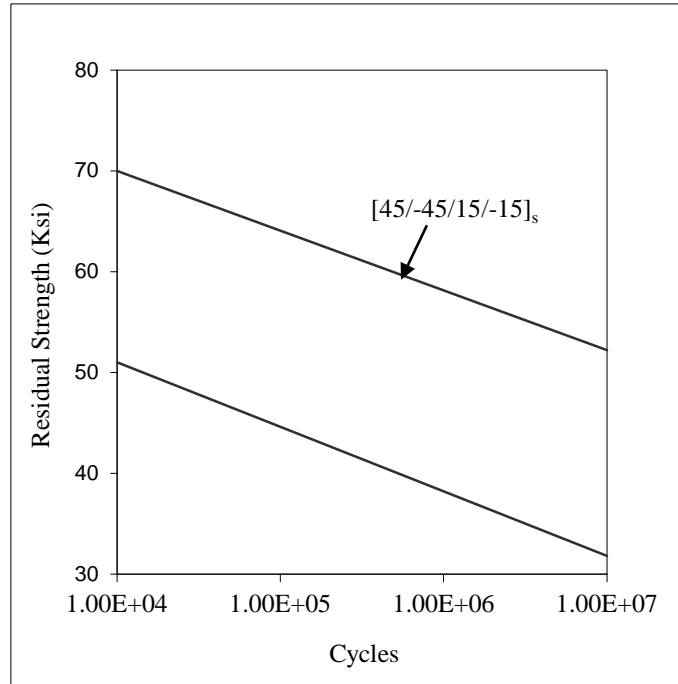


FIGURE 5.7

Comparison of residual strength as a function of number of cycles for two laminates. (Reprinted from Pagano, J.J. and Soni, S.R., in *Interlaminar Response of Composite Materials*, Pagano, N.J., Ed., 1989, p.12, Elsevier Science, New York, with kind permission from authors.)

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