In [1]:
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run -i MECH530_main.py
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PLYBOOK (READ FROM EXCEL FILE AND SUMMARIZED HERE)

The laminate is given by the following plybook where the highest ply number '8'
 indicates the top layer, while the first ply number '1' indicates the bottom l
ayer.

Unique Ply #, Fiber/Matrix, Orientation, Thickness
                              (degrees)      (mm)
     8      E-glass/Epoxy        55         0.125
     7      E-glass/Epoxy       -25         0.125
     6      E-glass/Epoxy       -55         0.125
     5      E-glass/Epoxy        25         0.125
     4      E-glass/Epoxy        25         0.125
     3      E-glass/Epoxy       -55         0.125
     2      E-glass/Epoxy       -25         0.125
     1      E-glass/Epoxy        55         0.125

PLIES AND THICKNESSES
-Total number of plies in the laminate: 8
-Total thickness of laminate is: 1.000 mm
-There is no core in the laminate (Zc = 0 mm)
-Laminate contains 1 Fiber/Matrix combination. The material properties for this
 combination shall be listed below.

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MATERIALS AND MATERIAL PROPERTIES

RESIN/MATRIX 1 of 1: For E-glass/Epoxy, the given material properties are:

-Stiffness and Strength:

Ex =  38.6000 GPa, Ey =   8.2700 GPa, Es =   4.1400 GPa and nu_x =   0.2600

Xt = 1062.0000 MPa, Xc = 610.0000 MPa, Yt =  31.0000f MPa, Yc = 118.0000 MPa an
d Sc =  72.0000 MPa.

-The 'on-axis' matrices are given by the following:
S_on =
[[   0.0259   -0.0067       0.0]
 [  -0.0067    0.1209       0.0]
 [      0.0       0.0    0.2415]] [1/GPa]

Q_on =
[[  39.1673    2.1818       0.0]
 [   2.1818    8.3915       0.0]
 [      0.0       0.0    4.1400]] [GPa]

-The linear combinations of the modulus, independent of ply angle are the follo
wing:
Us_1 =    0.0836 [1/GPa]
Us_2 =   -0.0475 [1/GPa]
Us_3 =   -0.0102 [1/GPa]
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Us_4 =   -0.0169 [1/GPa]
Us_5 =    0.2009 [1/GPa]

-The linear combinations of the modulus, dependent on ply angle are the followi
ng:
Uq_1 =   20.4500 GPa
Uq_2 =   15.3879 GPa
Uq_3 =    3.3294 GPa
Uq_4 =    5.5112 GPa
Uq_5 =    7.4694 GPa

-The 'Stiffness' [A] and 'Compliance' [a] matrices are given by the following:
A =
[[   0.0212    0.0071       0.0]
 [   0.0071    0.0166       0.0]
 [      0.0       0.0    0.0090]] [GN/m]

a =
[[  55.0092  -23.4870      -0.0]
 [ -23.4870   70.3723      -0.0]
 [      0.0       0.0  110.6965]] [m/GN]

-The 'In-Plane Flexural Modulus' [D] and 'In-Plane Flexural Compliance' [d] mat
rices are given by the following:
D =
[[   0.0015    0.0006   -0.0000]
 [   0.0006    0.0016    0.0003]
 [  -0.0000    0.0003    0.0008]] [kNm]

d =
[[812198.1980 -346646.5637 151552.3488]
 [-346646.5637 828946.0612 -329499.4659]
 [151552.3488 -329499.4659 1407375.4402]] [1/MNm]

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INPUTS:

Would you like to input a resultant applied stress? ON/OFF/NO
NO
Would you like to input a resultant applied moment? ON/OFF/NO
NO

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In [2]:
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0.0015/.0016
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Out[2]:
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0.9375
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