
tsaihill

Computes the strength ratio of a unidirectional lamina based on Tsai-Hill failure theory

Inputs

angle - Angle of ply in degrees
moduli - [E1 E2 nu12 G12]
 E1 - Local longitudinal elastic modulus
 E2 - Local transverse elastic modulus
 nu12 - Local major Poisson's ratio
 G12 - Local in-plane shear modulus
strain_glo - [epsx;epsy;epsxy]
 epsx - Global longitudinal strain
 epsy - Global transverse strain
 epsxy - Global in-plane strain
strength - [s1tu s1cu s2tu s2cu s12u]
 s1tu - Ultimate longitudinal tensile strength
 s1cu - Ultimate longitudinal compressive strength
 s2tu - Ultimate transverse tensile strength
 s2cu - Ultimate transverse compressive strength
 s12u - Ultimate in-plane shear strength

Outputs

SR - Strength Ratio of unidirectional lamina

Calling the Function

[SR]=tsaihill(strain_glo,angle,moduli,strength)

Testing File

Click [here](#) to see a testing file for using the function tsaihill

Example

Inputs:

Longitudinal Elastic Modulus: 1.81e+11
Transverse Elastic Modulus: 1.03e+10
Poisson's Ratio: 0.28
Shear Modulus: 7.17e+09
Longitudinal Global Strain: 4.42e-08
Transverse Global Strain: -1.238e-08
In-Plane Global Shear Strain: 0
Ultimate Longitudinal Tensile Strength: 1.5e+09
Ultimate Longitudinal Compressive Strength: -1.5e+09
Ultimate Transverse Tensile Strength: 4e+07
Ultimate Transverse Compressive Strength: -2.46e+08
Ultimate In-Plane Shear Strength: 6.8e+07
Angle of Lamina: 0

Outputs:

Strength Ratio for Lamina

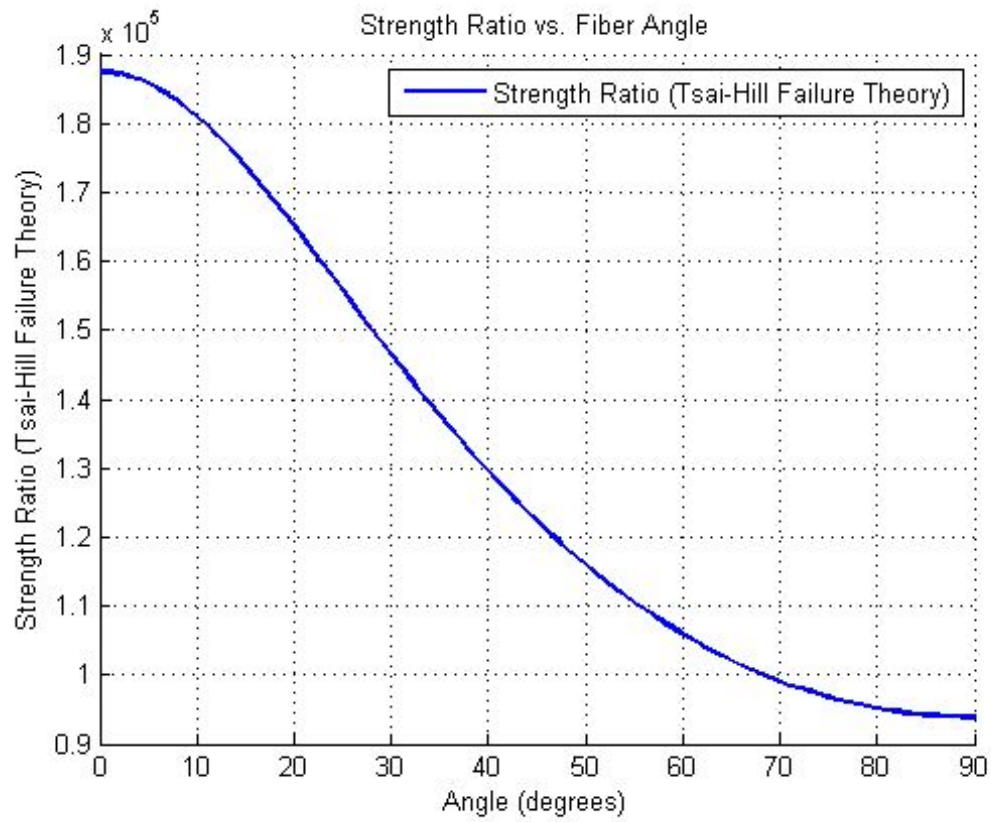
SR | 187495

Table:

Angle Lamina Strength Ratio

angle	SR
0	187495.0957
10	180962.0550
20	165022.0279
30	146384.7598
40	129482.8007
50	115936.0064
60	105912.5295
70	99109.9762
80	95185.0283
90	93903.6690

Graph:



Description

Outputs strength ratio for a unidirectional lamina based on Tsai-Hill failure theory