# maximumstrain

Computes the strength ratio of a unidirectional lamina based on maximum strain 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]=maximumstrain(strain_glo,angle,moduli,strength)
```

## Testing File

Click here to see a testing file for using the function maximumstrain

## Example

Inputs:

```
Longitudinal Elastic Modulus: 1.81e+11
Transverse Elastic Modulus: 1e+10
Poisson's Ratio: 0.25
Shear Modulus: 7.17e+09
Longitudinal Global Strain: 0.0007486
Transverse Global Strain: -0.001157
In-Plane Global Strain: 0.002306
Ultimate Longitudinal Tensile Strength: 1.26e+09
```

Ultimate Longitudinal Compressive Strength: 2.5e+09
Ultimate Transverse Tensile Strength: 6.1e+07
Ultimate Transverse Compressive Strength: 2.02e+08
Ultimate In-Plane Shear Strength: 6.7e+07
Angle of Lamina: 60

Outputs:

Strength Ratio for Lamina

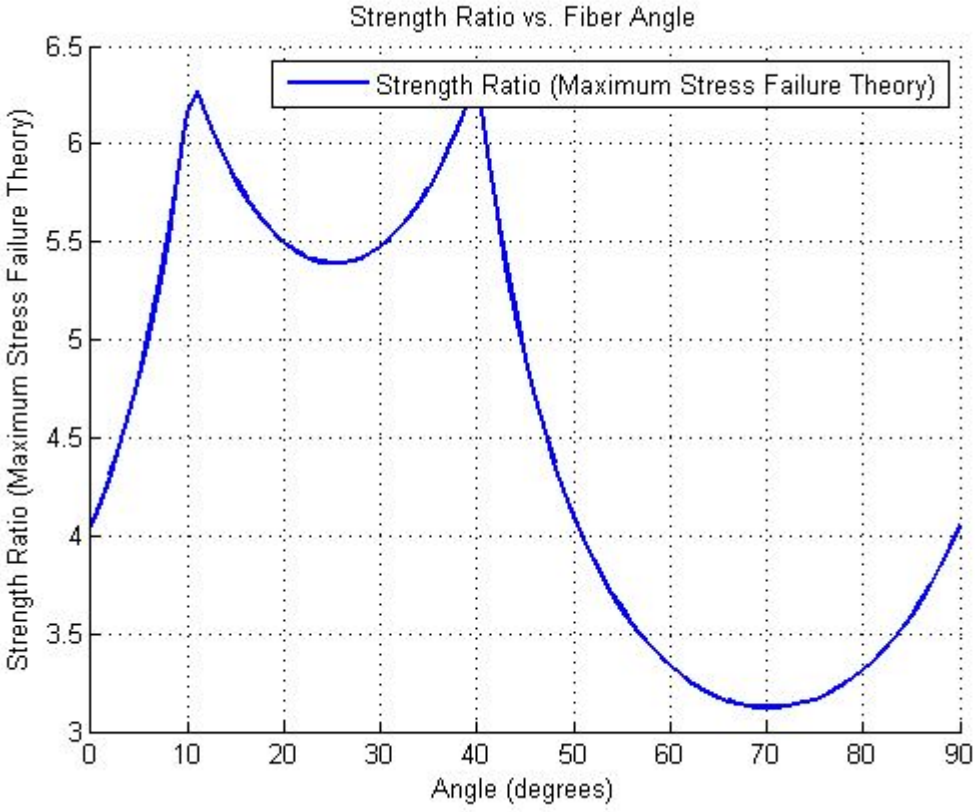
| | |
|---|---|
| SR | 3.33339 |

Table:

Angle Lamina Strength Ratio

| angle | SR |
|---|---|
| 0 | 4.0523 |
| 10 | 6.1673 |
| 20 | 5.4951 |
| 30 | 5.4782 |
| 40 | 6.3300 |
| 50 | 4.1037 |
| 60 | 3.3334 |
| 70 | 3.1238 |
| 80 | 3.3152 |
| 90 | 4.0523 |

Graph:




## Description

Outputs strength ratio for a unidirectional lamina based on maximum strain theory