Strain Components

EPSX	Normal strain in the X-direction of the selected reference geometry
EPSY	Normal strain in the Y-direction of the selected reference geometry
EPSZ	Normal strain in the Z-direction of the selected reference geometry
GMXY	Shear strain in the Y direction in the YZ-plane of the selected reference geometry
GMXZ	Shear strain in the Z direction in the YZ-plane of the selected reference geometry
GMYZ	Shear strain in the Z direction in the XZ-plane of the selected reference geometry
ESTRN	Equivalent strain
SEDENS	Strain energy density [a]
ENERGY	Total strain energy [b]
E1	Normal strain in the first principal direction
E2	Normal strain in the second principal direction
E3	Normal strain in the third principal direction
Strain Type	Used for nonlinear studies only
Total	Total strain due to various effects
Plastic	Nonrecoverable strain
Elastic	Recoverable strain
Thermal	Strain due to thermal effects
Creep	Strain due to creep effects

Equivalent strain (ESTRN)

$$ESTRN=2\ [(\varepsilon_1+\varepsilon_2)/3]^{(1/2)}$$

Where:

$$\varepsilon_1 = 0.5\ [(EPSX - \varepsilon^*)^2 + (EPSY - \varepsilon^*)^2 + (EPSZ - \varepsilon^*)^2]$$

$$\varepsilon_2 = [(GMXY)^2 + (GMXZ)^2 + (GMYZ)^2] / 4$$

$$\varepsilon^* = (EPSX + EPSY + EPSZ) / 3$$

Total strain energy (ENERGY)

Total Strain Energy = ∑ [(SX * EPSX + SY * EPSY + SZ * EPSZ + TXY * GMXY + TXZ * GMXZ + TYZ * GMYZ) * Vol(i) * W(i) /2] for i=1 , N int

N int are the integration points (or Gaussian points), W(i) is the weighted constant at integration point i, and

(SX = X normal stress, SY = Y normal stress, SZ = Z normal stress, TXY = Shear in Y direction on YZ plane, TXZ = Shear in Z direction on YZ plane, TYZ = Shear in Z direction on XZ plane)

Strain energy density (SEDENS)

SEDENS = Total Strain Energy / Volume , Volume = ∑ [Vol(i) * W(i)] , i =1, N int.