

LIST OF ABBREVIATIONS AND SYMBOLS

FEM	Finite Element Method
BEM	Boundary Element Method
LEFM	Elastic Fracture Mechanic
EPFM	Elastic Plastic Fracture Mechanics
CTOD	Crack Tip Opening Displacement
VACNT	Vertically Aligned Carbon Nano Tube
PFM	Probabilistic fracture mechanics
SSY	Small Scale Yielding
HRR	Hutchinson, Rice and Rosengren
X-FEM	Extended Finite Element Method
CZM	Cohesive Zone Model
FDM	Finite Difference Method
σ_{ij}	Stress Tensor
$\sigma_{xx}, \sigma_{yy}, \sigma_{zz}$	Stress Components in x, y and z direction
ν	Poisson ratio
μ	Shear modulus
K	Stress Intensity Factor
r_t	Radius
u_{xx}, u_{yy}, u_{zz}	Displacement in x, y and z direction
K_{IC}	Mode I Critical Stress Intensity Factor
U	Potential Energy
V	Volume of the Body
W	Strain Energy Density
S_t	Part of the body Subjected to Traction
E	Young's Modulus
G	Energy Release Rate

Γ	Contour Enclosing the Crack Tip
n	Unit Outward Normal on Γ
\bar{T}	Surface Traction
T_i	Traction Vector
r_y	Irwin Plastic Zone Correction
d	Crack Tip Opening Displacement
a	Half Crack Length
J_{app}	Applied J integral
F_{ij}	Deformation Gradient
e_{ij}	Eulerian Strain Tensor
D_{ij}	Deformation Tensor
L_{ij}	Velocity Gradient
W_{ij}	Velocity tensor or spin tensor
ρ	Density
$\hat{\tau}_{ij}$	Jaumann rate of Kirchhoff stress
$\dot{\epsilon}_p$	Plastic Strain Rate
σ_e	Effective Equivalent Stress
δ_{ij}	Kronecker Delta
p_{ij}	Deviatoric Kirchhoff Plastic Stress Tensor
L_{ijkl}	Tensor of elastic Moduli
$\dot{\epsilon}_0$	Reference Strain Rate
m	Rate Hardening Exponent
σ_0	Reference Stress
α_p	Plastic Compressibility

Symbols not listed here, are defined as they appear in text.