

## NASCRAC™ Software Crack Geometry Library

Crack Geometry Description	Crack Front Shape	Finite Width Effects	Variable Thickness (K only)	Stress Input Types Available for						
				K-Solutions			J-Solutions			Crack Opening Areas
				General	Uniform	Pin Load	Uniform	Load and Moment	Pin Load	Uniform
<b>Standard Specimens</b>										
Compact Tension	Straight	✓	–	–	–	✓	–	–	✓	–
Disk-Shaped Compact	Straight	✓	–	–	–	✓	–	–	–	–
Arc-Shaped	Straight	✓	–	–	–	✓	–	–	✓	–
Standard 3-Point Bend	Straight	✓	–	–	–	✓	–	–	–	–
<b>Through-Thickness Cracks in Planar Bodies</b>										
Crack in an Infinite Plate	Straight	–	–	✓	–	–	–	–	–	✓
Center-Cracked Plate	Straight	✓	✓	✓	✓	–	✓	–	–	✓
Single Edge Crack in a Plate	Straight	✓	✓	✓	✓	–	✓	✓	–	–
Double Edge Crack in a Plate	Straight	✓	✓	✓	✓	–	✓	–	–	–
Axial (ID) Crack in a Hollow Cylinder	Circular	✓	✓	✓	✓	–	✓	–	–	–
Edge Crack in a Solid Disk	Straight	✓	✓	✓	✓	–	–	–	–	–
Axial (OD) Crack in a Hollow Cylinder	Straight	✓	✓	✓	–	–	–	–	–	–
Through Crack from a Hole in a Plate	Straight	✓	–	–	✓	✓	–	–	–	–
Through Crack from a Hole in a Lug	Straight	✓	–	–	–	✓	–	–	–	–
Single Edge Crack in a Plate – No Rotation	Straight	✓	–	–	✓	–	–	–	–	–
Through Crack from a Hole – Biaxial Stress	Straight	–	–	–	✓	–	✓	–	–	–
<b>Through-Thickness Cracks in “Shells”</b>										
Through Crack in a Sphere	Straight	✓	–	–	✓	–	–	–	–	✓
Through Crack in a Cylinder – Axial	Straight	–	–	–	✓	–	–	–	–	✓
Through Crack in a Cylinder – Circumferential	Straight	–	–	–	✓	–	✓	✓	–	✓
<b>Cracks in Bodies of Revolution</b>										
Circumferential (ID) Crack in a Hollow Cylinder	Circular	✓	–	✓	✓	–	✓	–	–	–
Circumferential (OD) Crack in a Solid Cylinder	Circular	✓	–	–	✓	–	–	–	–	–

**NASCRAC™ Software Crack Geometry Library (cont'd)**

Crack Geometry Description	Crack Front Shape	Finite Width Effects	Variable Thickness (K only)	Stress Input Types Available for						Crack Opening Areas
				K-Solutions			J-Solutions			Uniform
				General	Uniform	Pin Load	Uniform	Load and Moment	Pin Load	
Circumferential (OD) Crack in a Hollow Cylinder	Circular	✓	–	–	✓	–	–	–	–	–
Edge Crack in a Solid Circular Bar	Curved	✓	–	–	✓	–	–	–	–	–
<b>Buried Cracks</b>										
Buried Elliptical Crack	Elliptical	✓	–	✓	–	–	–	–	–	–
User-Defined $g_2$ : Buried Elliptical Crack	Elliptical	✓	–	✓	–	–	–	–	–	–
<b>Corner Cracks</b>										
Quarter-Elliptical Surface Crack in a Plate	Qtr-Elliptical	✓	–	–	✓	✓	–	–	–	–
Quarter-Elliptical Crack from a Hole in a Lug	Qtr-Elliptical	✓	–	–	–	✓	–	–	–	–
Quarter-Elliptical Corner Crack in a Plate	Qtr-Elliptical	✓	–	✓	–	–	–	–	–	–
User-Defined $g_2$ : Quarter-Elliptical Corner Crack	Qtr-Elliptical	✓	–	✓	–	–	–	–	–	–
<b>Surface Cracks</b>										
Semi-Elliptical Surface Crack in a Plate	Semi-Elliptical	✓	–	✓	–	–	–	–	–	–
Semi-Elliptical Circumferential Surface Crack in a Cylinder (ID)	Semi-Elliptical	✓	–	✓	✓	–	✓	–	–	–
Semi-Elliptical Axial Surface Crack in a Cylinder (ID)	Semi-Elliptical	✓	–	✓	✓	–	✓	–	–	–
Semi-Elliptical Surface Crack in a Sphere (ID)	Semi-Elliptical	✓	–	✓	✓	–	–	–	–	–
User-Defined $g_2$ : Semi-Elliptical Surface Crack	Semi-Elliptical	✓	–	✓	–	–	–	–	–	–
Constant-Depth Part-Through-Wall Crack in Cylinder (ID)	Part-Circumferential	✓	–	–	✓	–	–	✓	–	–
<b>User-Defined K(a) Tables</b>										
User-Defined $a_1$ versus $K_1$ Table	–	–	–	–	–	–	–	–	–	–
<b>User-Defined IF or <math>h_1</math></b>										
User-Defined IF Coefficients	–	✓	–	✓	–	–	✓	–	–	–