



Verification Example 4

Fatigue Crack Growth

Problem Definition

- Verify Darwin™ fatigue crack growth calculation
- Semi- infinite block
 - 100 in x 100 in (2.54 m x 2.54 m)
- Circular initial defect at center
 - Radius = 10 mils (0.254 mm)
 - Area = 314.59 mils² (0.2029 mm²)
- Deterministic cyclic stress

Comparison Standard

- Numerical Solution
- Paris Crack-Growth Law:

$$\frac{da}{dN} = C(\Delta K)^n$$

Result

- The maximum error between the numerical and the Darwin™ solution is 1.05% at 100 ksi.

