Lecture 3, Workshop 1

Determining Fracture Mechanics Parameters

Determining K Problems

- 1. For the following specimen types generate K values at a_0 . (load in kN, dimensions in mm)
- a) Compact; W = 50, B = 25, $a_0 = 25$, P = 25
- b Compact; W = 500, B = 25, $a_0 = 250$, P = 80
- c) CCT; 2W = 250, B = 25, 2a_o = 50, P = 1000
- Now increase a by 5 mm and recalculate K

- 2. Use the handbook solution 2.10 (single edge crack) to get K for a stress = 200 MPa and b(W) = 100 mm.
- Let a = 2.5, 12.5, 37.5 mm.

• 3. What are the plane stress plastic zone sizes for the two K values in prob. 1a if

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$$\sigma_{ys} = 240 \text{ MPa},$$

 What is the percent of ligament (W - a) covered by the plastic zone